de maximis, inc.

Cedar Avenue Business Center
103 North Eleventh Avenue
Suite 210
St. Charles, IL 60174
(630) 443-1940
(630) 443-1942 FAX

October 30, 2003

VIA FIRST CLASS MAIL

Mr. Bernard Schorle (HSRL-6)
Waste Management Division
U. S. EPA Region V
77 West Jackson Blvd.
Chicago, IL 60604

Subject: ***Report of Water Quality Conditions, Second Quarter 2003***
Marion (Bragg) Landfill, Marion, Indiana

Dear Mr. Schorle:

On behalf of the Marion (Bragg) Group, please find enclosed three (3) copies of the Report of Water Quality Conditions for the second quarter of 2003, prepared by O&M, Inc., for the subject site.

Please contact me at (630) 443-1940 with any questions on the enclosed reports.

Sincerely,
de maximis, inc.

Gary E. Parker

Gary E. Parker

Enclosures

cc: Resa Ramsey, IDEM (cover plus one copy)
John Hanson, Esq., Beveridge & Diamond, P.C. (cover plus one copy)
Rick Meyers, United Technologies (cover plus one copy)
Dan Garrigan, O&M Inc. (cover via facsimile only)
Mark Travers, Environ (cover plus one copy)

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REPORT OF

WATER QUALITY CONDITIONS
SECOND QUARTER 2003
MARION (BRAGG) LANDFILL

MARION, INDIANA

Prepared on Behalf of:

MARION (BRAGG) LANDFILL GROUP

Prepared by:

O & M, Inc.
303 N. Indiana St.
Danville, IN 46122

OCTOBER 2003

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1.0 INTRODUCTION

This report presents water level data, field water quality measurements and results of laboratory analyses for water samples collected at the Marion (Bragg) Landfill site during the semi-annual monitoring event conducted in April 2003. The monitoring program was designed to document the effectiveness of the landfill cap and is described in detail in the Remedial Action Plan (RAP) (Environmental Resources Management (ERM), 1989, Remedial Action Plan, Marion (Bragg) Landfill Site, Marion, Indiana) and Remedial Design/Remedial Action (RD/RA) Work Plan (Environmental Resources Management, 1989, Remedial Design/Remedial Action Work Plan, Marion (Bragg) Landfill Site, Marion, Indiana).

This sampling event continues to implement a condensed monitoring program after the U.S. Environmental Protection Agency (USEPA) issued a no-further-action Record of Decision for this site. Over Twelve (12) years of monitoring data had been collected, since the start of the monitoring program in January 1990.

With concurrence of the USEPA, the number of sampling locations and parameters has been reduced. Monitoring has been reduced to the following locations: for ground water, MB-1, MB-2, MB-5, MB-6, MB-7, MB-8, MB-9, and MB-10, and for surface water, PW-1, SW-1, SW-5, and SW-6.

The sampling program consisted of sampling the on-site monitoring wells (MB-1, -2, and -5 through -10), the on-site pond (PW-1), the Mississinewa River (SW-1 and SW-5), and Lugar Creek (SW-6) for the Target Compound List (TCL) semi-volatiles, Target Analyte List (TAL) metals (dissolved fraction), and the project specific indicator parameters, total suspended solids (TSS), ammonia-nitrogen (NH_3-N), chemical oxygen demand (COD), and chlorides (Cl). Selected locations of MB-1, MB-2, and SW-1 are sampled for Target Compound List (TCL) volatiles. These parameters and locations

conductance, and dissolved oxygen) are collected at each of the stated sampling locations.

Water quality sampling at the Marion (Bragg) Landfill for the referenced period was performed on April 29th and 30th, 2003. All sampling and analyses were conducted in compliance with the requirements specified in the RD/RA Work Plan (ERM, 1989) and Quality Assurance Project Plan (ERM, 1990, Quality Assurance Project Plan, Remedial Design/Remedial Action, Monitoring and Additional Studies at the Marion (Bragg) Landfill Site, Marion, Indiana).

Copies of the chain-of-custody forms are included in Appendix A and the data validation report is included in Appendix B. Questions regarding specific analytes, concentrations, or qualifiers are addressed in the data validation report.

2.0 SITE CONDITIONS

Sampling event data is presented in attached Tables 1 through 12 and Figures 1 through 7. Review of that data indicates:

- The interpreted groundwater flow directions are the same as presented in previous reports.

- The water levels in wells, ponds, and river continue to follow seasonal trends (Figures 4 to 7). The water level in Monitoring Well (MW-8) was not measured due to obstruction in well. O&M Inc. unsuccessfully attempted to remove blockage and secured with new lock.

- No methane was detected at any site monitoring locations.

- No methane was detected at any site monitoring locations.

- Calculated concentrations of un-ionized ammonia exceeded the chronic aquatic criteria (CAC) in groundwater samples at downgradient locations, MB-2, MB-6, MB-7, and MB-8. (Table 10). However, after applying the mixing calculation, the concentrations were evaluated as being below the CAC (Table 12).

- The TCL volatile, trichloroethene, was detected in the groundwater sample from the on-site monitoring well, MB-1, at a concentration that exceeds the drinking water Maximum Contaminant Levels (MCLs). However, after applying the mixing calculation, the concentrations were evaluated as being below these criteria (Table 12).

- The TAL metals (dissolved), arsenic and iron were detected in groundwater samples from on-site monitoring wells MB-1, MB-2, MB-5, MB-6, MB-7, MB-8 and MB-9 at concentrations which exceeded the appropriate water quality criteria. However, after applying the mixing calculation, the concentrations dropped below the criteria (Table 12).

3.0 COMMENTS

The following general comments are provided regarding sampling procedures, sample documentation, and the data validation report:

- The data validator noted that VOC analysis was not noted on the COC for sample GW07PB. Analysis was run.
- The data validator noted that the pH of the samples were not recorded on the COC upon receipt at the laboratory. The pH of the samples are recorded on the commercial receiving logs attached in Appendix A.
- A copy of the courier airbill is attached to this report as Appendix C
- The data validator noted that matrix spike and matrix spike duplicate (MS/MSD) samples should not be recorded on the COC forms as separate samples, but that extra sample volume should be obtained for the analysis. The sample numbering procedures specified in the Quality Assurance Project Plan (QAPP) calls for the use of a suffix added to distinguish additional sample volumes obtained for MS/MSD analysis. This procedure has been used for all sampling events to date and has proven satisfactory. O&M, Inc. will continue to follow the sample numbering and COC procedures specified in the QAPP until instructed otherwise.

FIGURES

Figure 1
Site Location
Marion (Bragg) Landfill

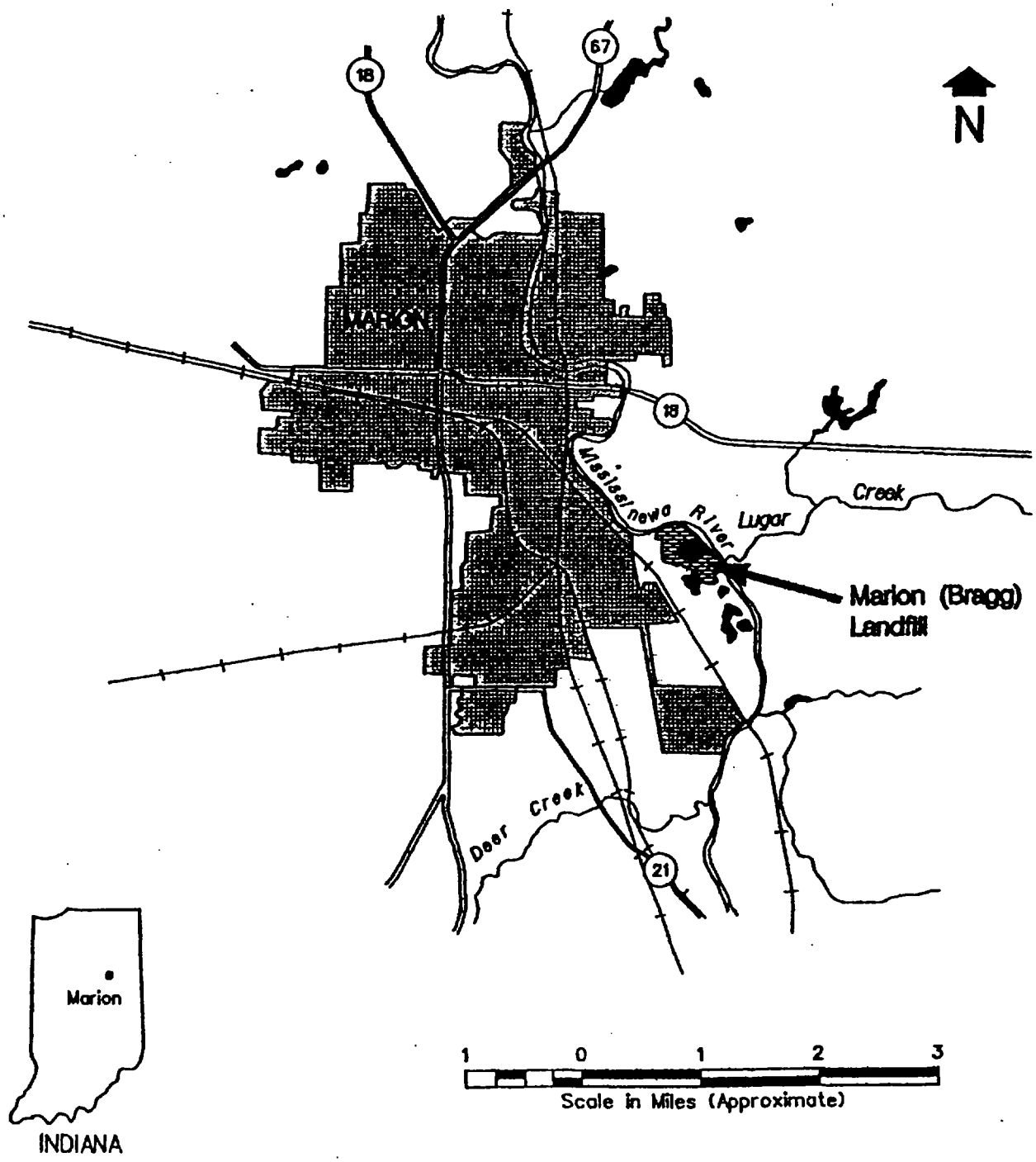


Figure 2
Sampling Locations
Marion (Bragg) Landfill

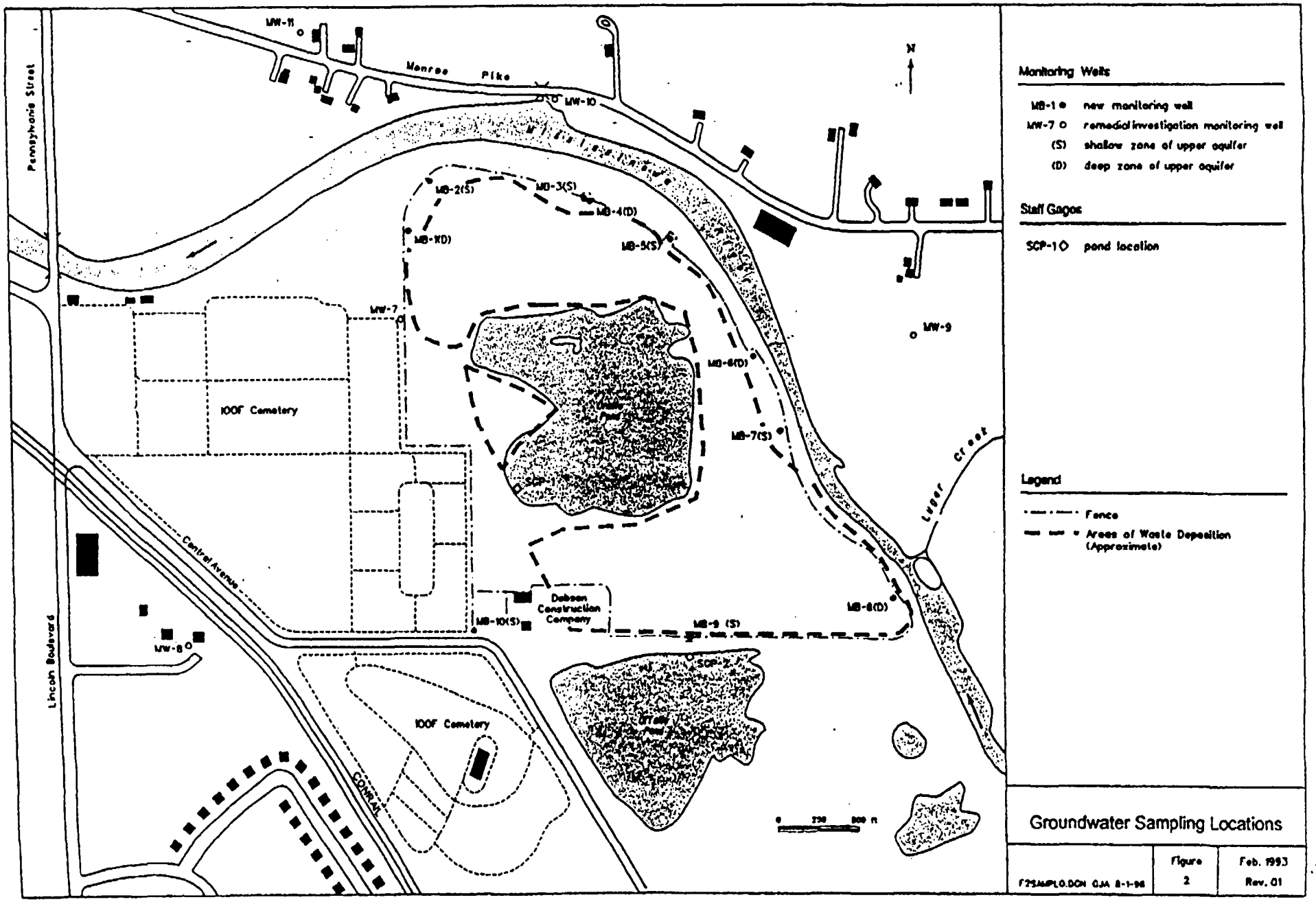


Figure 3
Groundwater Contour Map
Marion (Bragg) Landfill

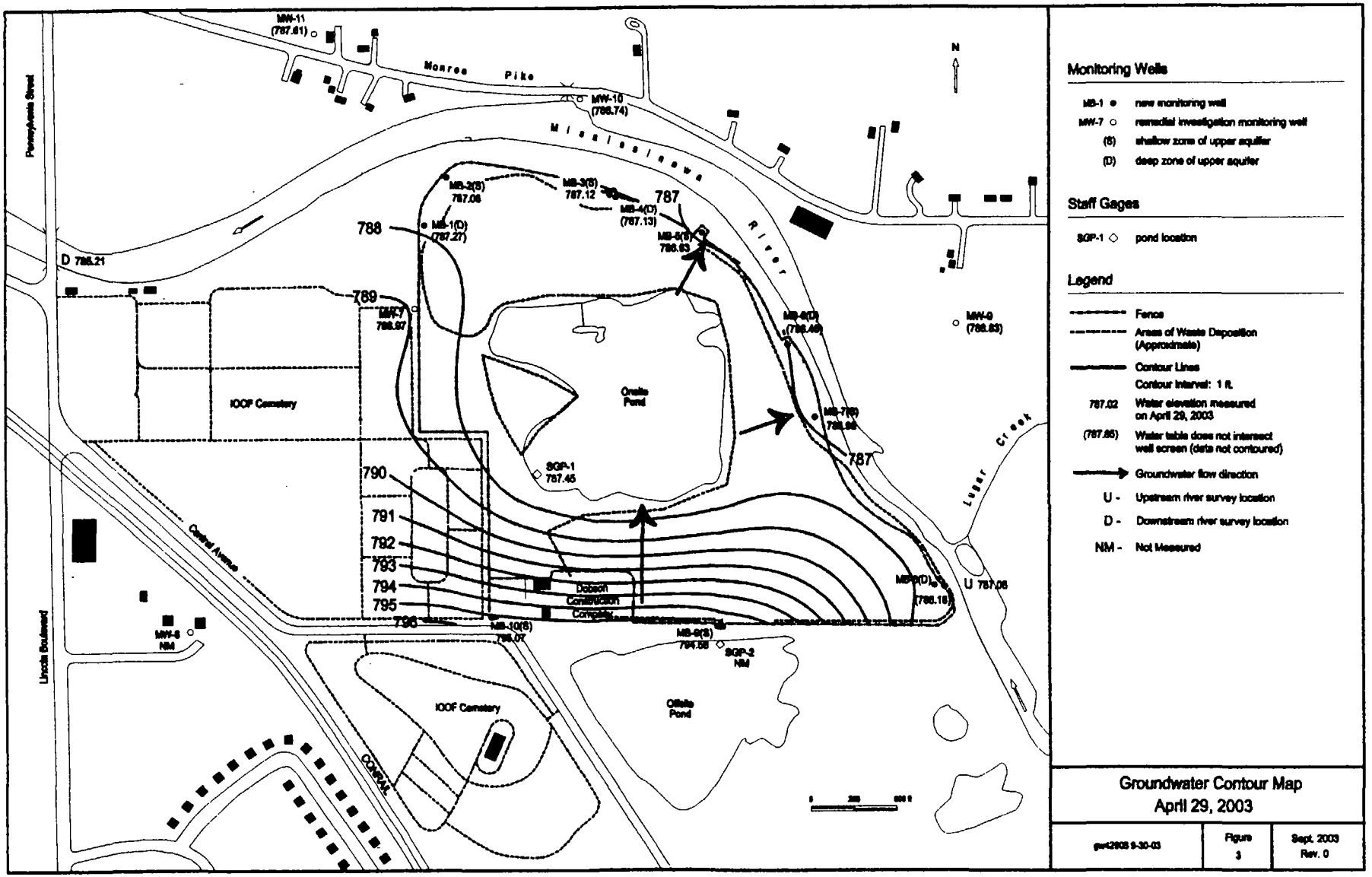


Figure 4. Hydrograph for
Off-site Monitoring Wells

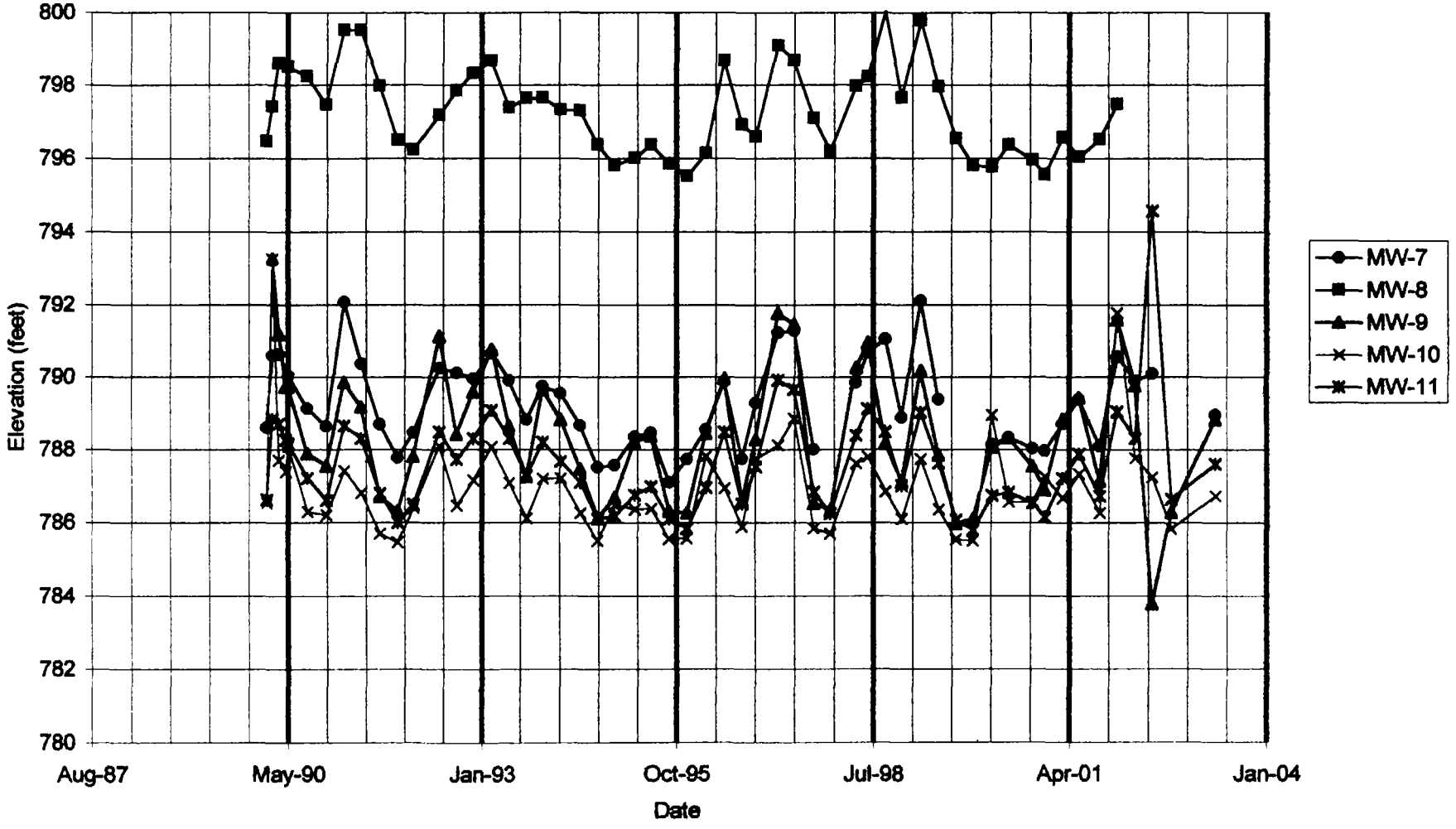


Figure 5. Hydrograph for Shallow, Upper Aquifer Monitoring Wells

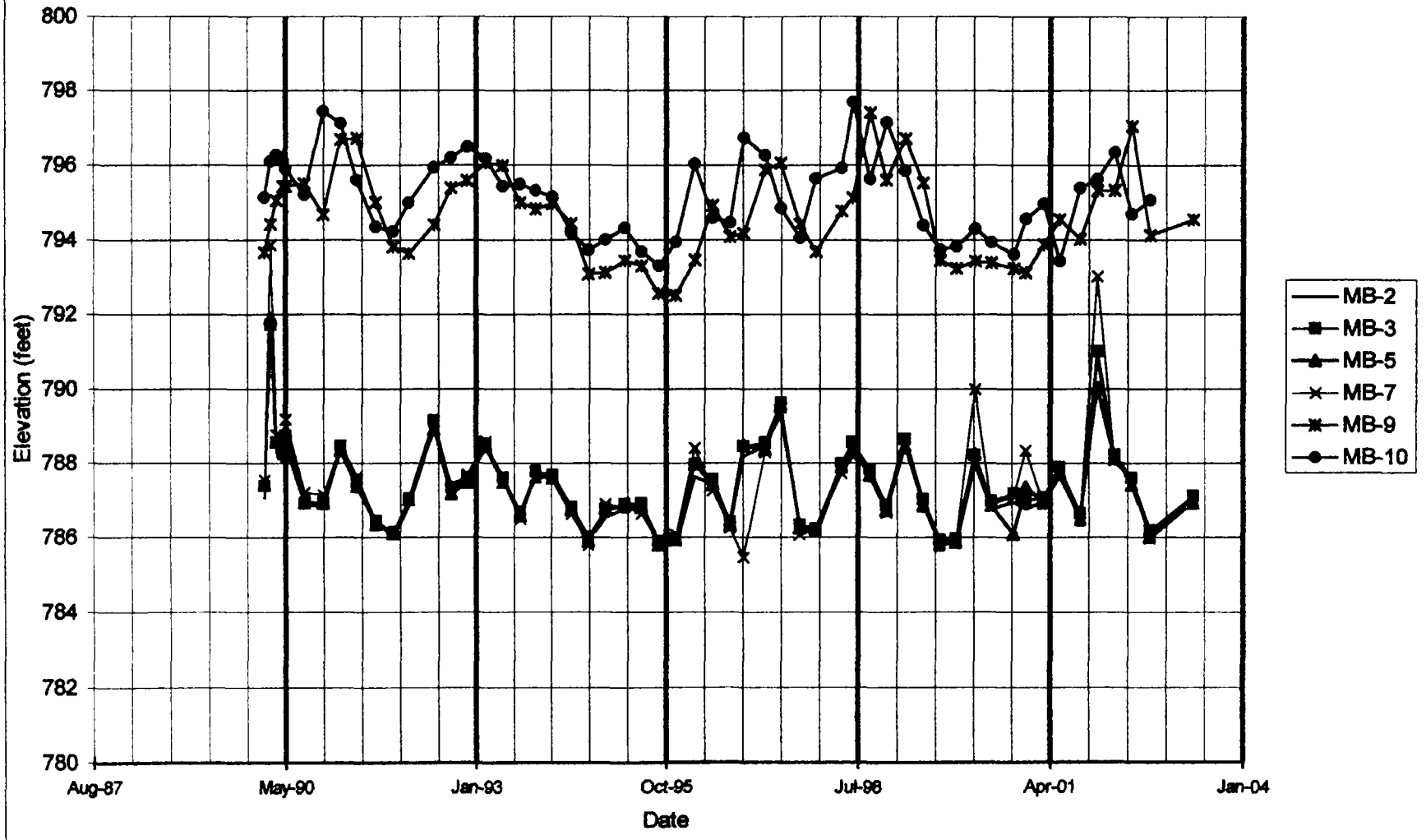


Figure 6. Hydrograph for Deep,
Upper Aquifer Monitoring Wells

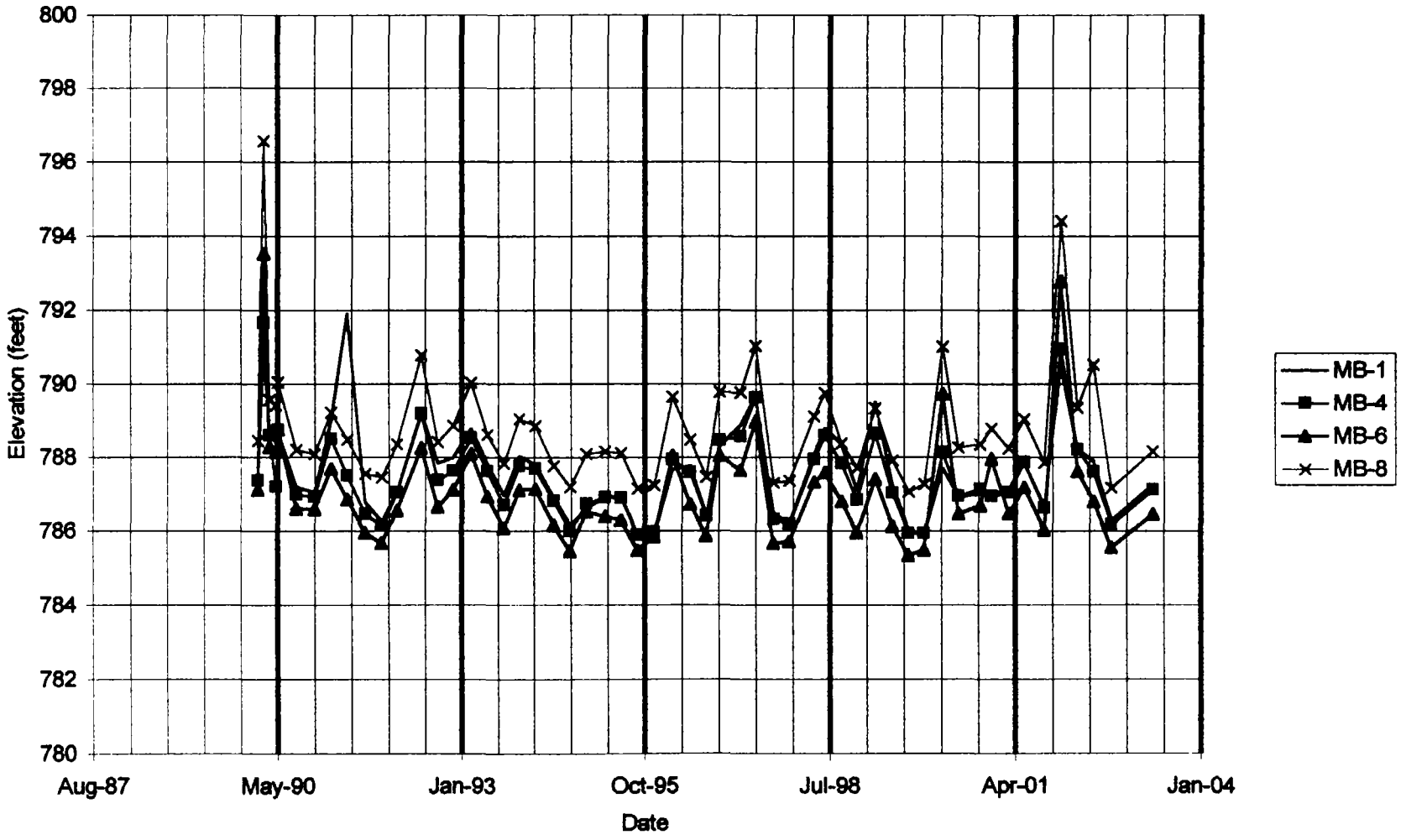
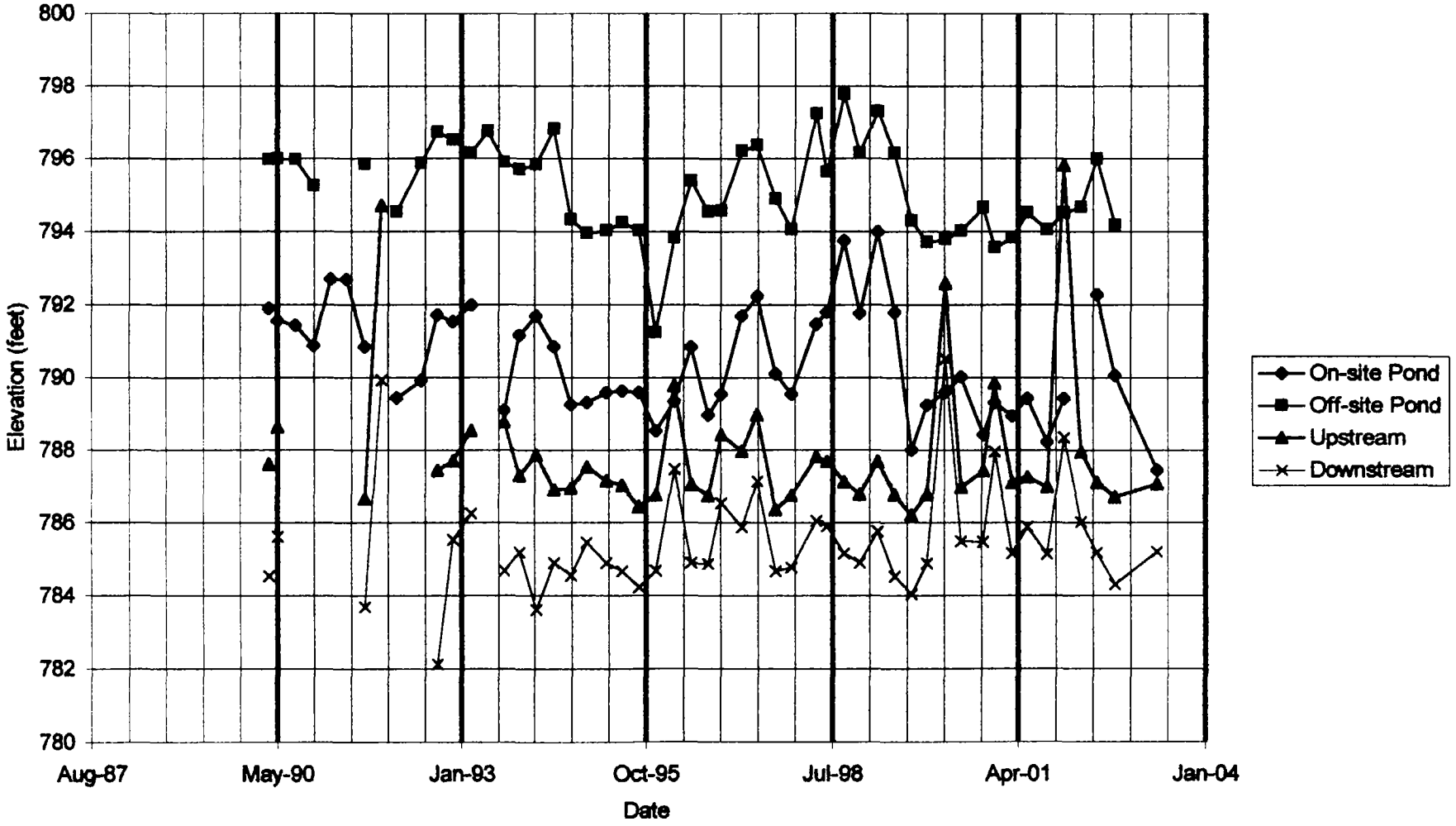


Figure 7. Hydrograph for
Surface Water Locations



TABLES

Table 1

SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

Matrix	Number of Samples	Number of Trip Blanks*	Number of Field Blanks*	Number of Field Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate Samples **	Total Matrix	Analyses	Container and Preservation	Holding Times
							LABORATORY		
GROUND WATER (Initial and semiannual sampling. Confirmatory samples shall be taken during the quarter following the sampling event that revealed the presence of a parameter requiring such confirmatory sampling. Sampling is anticipated for 30 years.)	8 (Note 1)	3	1	1	2	13	TCL Volatiles	2-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	14 days
							pH Check	1-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	28 days
							TCL BNAs	2-1 liter amber glass w/ Teflon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days after extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (Cl) 28 days(NH3-N)
							COD	1-250 ml plastic H2SO4 to pH <2. Cool to 4C	28 days
							FIELD		
							pH, Conductivity D.O. and Temp.	Measure in field to stability before collection.	In field.

Note 1: Wells MB-3 and MB-4 were not sampled this quarter as part of an interim reduced monitored program following a "No further action" ROD.

* - Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

** - Triple the volume for groundwater and surface water locations will be collected for matrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples. Inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

Table 1 - Continued

SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

Matrix	Number of Samples	Number of Trip Blanks*	Number of Field Blanks*	Number of Field Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate Samples **	Total Matrix	Analyses	Container and Preservation	Holding Times
							LABORATORY		
SURFACE WATER (Initial and semiannual sampling. Confirmatory samples shall be taken during the quarter following the sampling event that revealed the presence of a parameter requiring such confirmatory sampling. Sampling is anticipated for 30 years.)	4 (Note 1)	3	1	1	2	9	TCL Volatiles	2-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	14 days
							pH Check	1-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	28 days
							TCL BNAs	2-1 liter amber glass w/ Teflon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days after extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (Cl) 28 days(NH3-N)
							COD	1-250 ml plastic H2SO4 to pH <2. Cool to 4C.	28 days
							FIELD		
							pH, Conductivity D.O. and Temp.	Measure in field to stability before collection.	In field.

Note 1: The on-site pond location of PW-2, off-site pond locations of PW-3 and PW-4, and river locations of SW-2, -3, and -4 were not sampled this quarter as part of an interim reduced monitored program following a "No further action" ROD.

* - Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

** - Triple the volume for groundwater and surface water locations will be collected for matrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples. Inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

TABLE 2: WATER LEVEL AND METHANE MONITORING DATA, MARION (BRAGG) LANDFILL, APRIL 29, 2003

Monitoring Location	Top of Casing Elevation (ftamsl)	Stickup (ft)	Ground Surface Elevation (ftamsl)	Methane Concentration (%)	Water Level (ftbtoc)	Water Elevation (ftamsl)
MB-1	799.57	2.50	797.07	0.0	12.30	787.27
MB-2	801.75	2.80	798.95	0.0	14.69	787.06
MB-3	806.15	2.70	803.45	0.0	19.03	787.12
MB-4	805.96	2.60	803.36	0.0	18.83	787.13
MB-5	806.67	3.00	803.67	0.0	19.94	786.93
MB-6	803.56	3.50	800.06	0.0	17.12	786.46
MB-7	812.73	3.00	809.73	0.0	25.78	786.95
MB-8	810.73	3.00	807.73	0.0	22.55	788.18
MB-9	814.73	2.80	811.93	0.0	20.17	794.56
MB-10	822.35	3.10	819.25	0.0	27.28	795.07
MW-7	802.36	2.82	799.54	0.0	13.39	788.97
MW-8 (1)	810.87	3.08	807.79	NM	NM	NM
MW-9	808.04	2.57	803.47	0.0	17.21	788.83
MW-10	803.17	2.27	800.90	0.0	16.43	786.74
MW-11	811.09	2.83	808.26	0.0	23.46	787.61
Staff Gauges	**Elev. at the 0 Mark of Staff Gauge**				**Distance Below 0 Mark of Staff Gauge (2)**	
SGP-1 (2)	787.45	NA	NA	NM	0.00	787.45
Staff Gauges	**Top of Staff Gauge Elevation**				**Distance Below Top of Staff Gauge (3)**	
SGP-2	798.16	NA	NA	NM	NM	
River Elevation	**Benchmark Elevation**				**Surveyed Distance**	
Upstream location (4)	810.73	NA	NA	NM	23.67	787.06
Downstream location (5)	798.94	NA	NA	NM	11.73	785.21

Notes:

Stickup - Measured distance between the ground surface and the top of casing

ftamsl - feet above mean sea level

ftbtoc - feet below top of casing. For staff gauges, valve presented is measurement (in feet) below level of staff gauge.

(1) MW-8 was not measured due to blockage in well.

(2) O&M Inc. reinstalled and resurveyed during this quarter sampling event.

(3) Pond water level measured from surveyed top of staff gauge down to pond water.

(4) Elevations determined by surveying to known benchmark elevations; benchmark for upstream location MB-8 top of casing.

(5) Elevations determined by surveying to known benchmark elevations; benchmark for downstream location is concrete spillway on east side of McFeeley Bridge.

SGP-1 - On-Site Pond

SGP-2 - Off-Site Pond

NM - Not Measured

NA - Not Applicable

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, APRIL 2003

Well I.D.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)		Date	Volume Pumped (gal)	pH	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)
MB-1	37	2.50	12.30	4.00		04/30/03						
							12.0	7.5	14.0	700	888	2.3
							12.5	7.5	14.0	700	888	2.0
							13.0	7.4	14.0	700	888	2.3
MB-2	18	2.80	14.69	0.54		04/30/03						
							2.0	7.0	16.0	1000	1207	2.9
							2.5	6.9	15.0	1000	1238	2.2
							3.0	6.9	15.0	950	1176	2.4
MB-3	24	2.70	19.03	0.81	*		(Well removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.)					
MB-4	35	2.60	18.83	2.62	*		(Well removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Re n Record of Decision.)					
MB-5	24	3.00	19.94	0.66		04/30/03						
							2.0	7.4	17.0	480	566	3.0
							2.5	7.2	15.5	800	978	1.3
							3.0	7.2	15.0	800	990	1.3
							3.5	7.2	14.5	800	1003	1.9
MB-6	28	3.50	17.12	1.76		04/30/03						
							5.5	7.0	15.0	780	965	1.4
							6.0	6.9	15.0	750	928	1.5
							6.5	7.0	14.5	780	977	1.2
MB-7	32	3.0	25.78	1.01		04/30/03						
							3.0	6.9	16.0	730	881	2.8
							3.5	7.1	16.0	750	905	2.7
							4.0	7.1	15.5	710	868	2.4
MB-8	36	3.0	22.55	2.18		04/30/03						
							5.0	7.3	16.0	1000	1207	1.8
							5.5	7.3	15.0	1000	1238	1.5
							6.0	7.2	15.0	1000	1238	1.5

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, APRIL 2003

Well I.D.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)	Date	Volume Pumped (gal)	pH	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)
MB-9	29	2.60	20.17	1.43	04/30/03						
						4.5	7.8	13.5	390	501	2.2
						5.0	7.8	13.5	400	514	2.0
						5.5	7.7	13.5	380	489	1.9
MB-10	30	3.10	27.28	0.44	04/30/03						
						1.5	7.4	13.5	650	836	4.4
						2.0	7.3	13.0	625	814	4.8
						2.5	7.2	13.0	625	814	4.8

Notes:
NA - Not Applicable
ftbtoc - feet below top of case
stickup - measured distance between the ground surface and the top of casing
(1) - Field measured conductivity.
(2) - Specific conductance value corrected to 25 C and adjusted using conversion factor (K).

Table 4

Data Qualifier Definitions

Qualifier	Description
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value represents its approximate concentration
UJ	The analyte was not detected about the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table 5
Marion (Bragg) Landfill
Sample Designation Key
Second Quarter 2003 Sampling Event
April 2003

Sample Designation	Sample Location	Parameters	Date Collected
Ground Water			
GW01PB	MB-10	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/30/03
GW02PB	MB-9	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/30/03
GW03PB	MB-5	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/30/03
GW04PB	MB-6	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/30/03
GW05PB	MB-7	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/30/03
GW06PB	MB-8	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/30/03
GW07PB	MB-2	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/30/03

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
GW08PB	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/30/03
GW08DPPB	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/30/03
GW08MSPB	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/30/03
GW08MSDPB	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/30/03
GW09FBPB	Field Blank	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/30/03
GW10TBPB	Trip Blank	VOCs	04/30/03
Pond Water			
PW01PB	PW-1 (On-site shallow)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/29/03

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
River Water			
SW01PB	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/29/03
SW01DPPB	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/29/03
SW01MSPB	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/29/03
SW01MSDPB	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	04/29/03
SW02PB	SW-5 (Upstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/29/03
SW03PB	SW-6 (Lugar Creek)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	04/29/03
SW04TBPB	Trip Blank	VOCs	04/29/03

Table 6: GROUNDWATER CHEMISTRY DATA, APRIL 2003

MONITORING WELL LOCATION IN AQUIFER	MB-1 BOTTOM	MB-2 TOP	MB-5 TOP	MB-6 BOTTOM	MB-7 TOP	MB-8 BOTTOM	MB-9 TOP	MB-10 TOP	DUPLICATE (MB-1)
TCL VOLATILES (ug/L)									
Acetone	10 UJ	10 UJ	NA	NA	NA	NA	NA	NA	10 UJ
Benzene	10 U	10 U	NA	NA	NA	NA	NA	NA	10 UJ
Chlorobenzene	10 U	0.8 J	NA	NA	NA	NA	NA	NA	10 U
Total 1,2-Dichloroethene	7 J	10 U	NA	NA	NA	NA	NA	NA	7 J
Trichloroethene	60 J	10 U	NA	NA	NA	NA	NA	NA	71
Vinyl Chloride	10 U	2 J	NA	NA	NA	NA	NA	NA	10 U
Carbon Disulfide	10 U	1 J	NA	NA	NA	NA	NA	NA	10 U
VOLATILE TENTATIVELY IDENTITFIED COMPOUNDS (Retention Time) (1)									
None detected									
TCL SEMIVOLATILES (ug/L)									
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	10 U
Hexachlorocyclopentadiene	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	11 UJ	10 UJ
2,4-Dinitrophenol	25 UJ	24 UJ R		R	R	R	24 UJ	11 UJ	25 UJ
Caprolactam	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	10 U
Acetophenone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.6 J	10 U
Napthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	10 U
1,1'-Biphenyl	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.4 J	10 U
Phenanthrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.3 J	10 U
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time) (1)									
Unknown		22 J	36 J	52 J	2 J	257 J	25 J	17 J	
Phenol, tert-butyl-isomer		4 J							
Butylated Hydroxytoluene								3 NJ	
Octadecanoic Acid								11 NJ	
2(3H)-Benzothiazolone				8 NJ					
1,4,5,6,7,7-hexachloro-bicyclo(2-2-1)hept-5-ene-2,3-dicarboxylic acid		67 NJ							
Sulfur		29 NJ	42 NJ				3 NJ		

Table 6: GROUNDWATER CHEMISTRY DATA, APRIL 2003

MONITORING WELL LOCATION IN AQUIFER	MB-1 BOTTOM	MB-2 TOP	MB-5 TOP	MB-6 BOTTOM	MB-7 TOP	MB-8 BOTTOM	MB-9 TOP	MB-10 TOP	DUPLICATE (2) (MB-1)
DISSOLVED TAL METALS (ug/L)									
Aluminium	40.9 U	40.9 U	57.9 U	45.3 U	40.9 U	64.8 U	52.7 U	42.4 U	40.9 U
Antimony	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Arsenic	6.0	77.7	33.4	122	64.1	118	6.2	2.2 U	6.5
Barium	192	627	365	410	540	248	68.6	97	191
Beryllium	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	119000	167000	98200	121000	88900	92700	57000	112000	119000
Chromium	0.60 U	0.60 U	0.74 U	1.1 U	1.1 U	1.5 U	0.60 U	0.60 U	1.1 U
Cobalt	2.2 J	1.3 J	2.2 U	2.6 U	0.70 U	1.4 U	0.70 U	0.70 U	2.2
Copper	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Iron	1670	29900	9410	16400	8300	10200	2210	55.2 U	1660
Lead	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Magnesium	34000	39200	54700	30200	31400	72500	21900	35400	34000
Manganese	928	266	184	79.2	67.4	109	486	3 U	927
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	3.7 J	2.4 J	2.7	12.5	1.2 J	2.5 J	1.2 U	1.4 J	2.4 J
Potassium	2330 J	11100	3610 J	9010 J	12700 J	18600 J	1200 J	2190 J	2340 J
Selenium	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	3.1 J	2.3 U	2.3 U	2.3 U
Silver	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U
Sodium	14600	19100	26200	16800	37000 J	60700	10100	15600	14600
Thallium	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ
Vanadium	2.2 J	2.5	2.5 U	2.4 U	1.8 U	3.3 U	1.4 U	2.1 U	2.3
Zinc	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ
INDICATOR PARAMETERS (mg/L)									
Ammonia-Nitrogen	R	7.6	1.7	3.6	5.1	4.1	0.43	0.10 U	R
Chemical Oxygen Demand	10.0 U	26.4 U	15.6 U	17.7 U	15.6 U	63 U	10.0 U	10.0 U	10.0 U
Chloride	22.9	21.3	20.9	17.8	20.8	39.7	14.0	27.8	21.8
Total Suspended Solids	17.4	62.0	6.8	5.2	33.6	17.2	36.4	25.4	16.4

Notes:

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.
Sampling locations, MB-3 and MB-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

(1) Unknown Tentatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data validation report.

Table 7: POND WATER CHEMISTRY DATA, APRIL 2003

SAMPLING LOCATION	OFFSITE POND	OFFSITE POND	ONSITE POND	ONSITE POND
LOCATION IN MATRIX	BOTTOM (PW-4)	TOP (PW-3)	BOTTOM (PW-3)	TOP (PW-1)
TCL VOLATILES (ug/L)				
NA	NA	NA	NA	NA
VOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time)				
NA	NA	NA	NA	NA
TCL SEMIVOLATILES (ug/L)				
NONE DETECTED				
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time) (1)				
NONE DETECTED				
DISSOLVED TAL METALS (ug/L)				
Aluminum	NA	NA	NA	21 U
Antimony	NA	NA	NA	4.5 U
Arsenic	NA	NA	NA	4.4 UJ
Barium	NA	NA	NA	146
Beryllium	NA	NA	NA	0.10 U
Cadmium	NA	NA	NA	1.20
Calcium	NA	NA	NA	45200
Chromium	NA	NA	NA	0.70 UJ
Cobalt	NA	NA	NA	1.40 U
Copper	NA	NA	NA	9.80 J
Iron	NA	NA	NA	19.2 U
Lead	NA	NA	NA	2.70 U
Magnesium	NA	NA	NA	26900
Manganese	NA	NA	NA	7.80
Mercury	NA	NA	NA	0.10 U
Nickel	NA	NA	NA	8.5 U
Potassium	NA	NA	NA	6980
Selenium	NA	NA	NA	2.6 U
Silver	NA	NA	NA	0.80 U
Sodium	NA	NA	NA	16200
Thallium	NA	NA	NA	7.0 UJ
Vanadium	NA	NA	NA	1.0 U
Zinc	NA	NA	NA	36.1
INDICATOR PARAMETERS (mg/L)				
Ammonia-Nitrogen	NA	NA	NA	0.10 U
Chemical Oxygen Demand	NA	NA	NA	17.7
Chloride	NA	NA	NA	17.1
Total Suspended Solids	NA	NA	NA	6.4
FIELD PARAMETERS				
Temperature (C)	NA	NA	NA	22.5
pH	NA	NA	NA	8.03
Conductivity (umhos/cm) (2)	NA	NA	NA	500
Conductivity (umhos/cm) (3)	NA	NA	NA	501
Dissolved Oxygen (mg/L)	NA	NA	NA	7.4

Notes:

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sampling locations, PW-2, PW-3, and PW-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

ND - Not Detected

(1) Unknown Tentatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data validation report.

(2) - field measured specific conductivity at ambient temperature

(3) - specific conductivity corrected to 25 degrees C.

Table 8: SURFACE WATER CHEMISTRY DATA, APRIL 2003

LOCATION	SW-1 Downstream	SW-2 Adjacent	SW-3 Adjacent	SW-4 Adjacent	SW-5 Upstream	SW-6 Lugar Creek	DUPLICATE (SW-1)
TCL VOLATILES (ug/L)							
	ND	NA	NA	NA	NA	NA	ND
VOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time)							
	ND	NA	NA	NA	NA	NA	ND
TCL SEMIVOLATILES (ug/L)							
	ND	NA	NA	NA		ND	ND
Caprolactam					18		
Diethylphthalate					0.4 J		
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time) (1)							
	ND	NA	NA	NA	ND		ND
Unknown						3 J	
DISSOLVED TAL METALS (ug/L)							
Aluminium	21.0 U	NA	NA	NA	21.0 U	21.0 U	21.0 U
Antimony	4.5 U	NA	NA	NA	4.5 U	4.5 U	4.5 U
Arsenic	4.4 UJ	NA	NA	NA	4.4 UJ	4.4 UJ	4.4 UJ
Barium	73.3	NA	NA	NA	73.4	81.5	73.1
Beryllium	0.10 U	NA	NA	NA	0.10 U	0.10 U	0.10 U
Cadmium	5.0 U	NA	NA	NA	0.40 UJ	0.40 UJ	0.40 UJ
Calcium	74200	NA	NA	NA	75100	90100	74400
Chromium	0.70 U	NA	NA	NA	0.70 UJ	0.70 UJ	0.70 U
Cobalt	0.90 U	NA	NA	NA	0.90 U	1.1 U	0.90 U
Copper	2.3 J	NA	NA	NA	2.3 U	2.3 U	25.0 U
Iron	19.2 U	NA	NA	NA	19.2 U	19.2 U	19.2 U
Lead	R	NA	NA	NA	2.7 U	2.7 U	R
Magnesium	31500	NA	NA	NA	32100	33500	31700
Manganese	20.2	NA	NA	NA	18.2	39.3	19.9
Mercury	0.10 U	NA	NA	NA	0.10 U	0.10 U	0.10 U
Nickel	3.9 U	NA	NA	NA	2.9 U	2.40 U	1.9 U
Potassium	2470	NA	NA	NA	2350	2910	2450
Selenium	5.0 U	NA	NA	NA	2.6 U	2.6 U	2.6 U
Silver	0.80 U	NA	NA	NA	0.80 U	0.80 U	0.80 U
Sodium	20100	NA	NA	NA	19700	28200	20000
Thallium	7.0 UJ	NA	NA	NA	7.0 UJ	7.0 UJ	7.0 UJ
Vanadium	1.0 U	NA	NA	NA	1.0 U	1.0 U	50.0 U
Zinc	8.5 U	NA	NA	NA	8.5 U	8.5 U	8.5 U
INDICATOR PARAMETERS (mg/L)							
Ammonia-Nitrogen	0.10 U	NA	NA	NA	0.10 U	0.10 U	0.10 U
Chemical Oxygen Demand	10.0 U	NA	NA	NA	10.0 U	19.9	10.0 U
Chloride	41.2	NA	NA	NA	40.3	53.8	40.5
Total Suspended Solids	4.8	NA	NA	NA	2.2	2.0	4.2
FIELD PARAMETERS							
Temperature (C)	23.0	NA	NA	NA	21.0	21.0	23.0
pH	8.19	NA	NA	NA	8.35	9.29	8.19
Conductivity (umhos/cm) (2)	600	NA	NA	NA	600	720	600
Conductivity (umhos/cm) (3)	595	NA	NA	NA	620	745	595
Dissolved Oxygen (mg/L)	9.02	NA	NA	NA	9.83	8.13	9.02

Notes:

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sampling locations, SW-2, SW-3, and SW-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

NR - Not recorded

ND - Not Detected

(1) Unknown Tentatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data validation report.

(2) - field measured specific conductivity at ambient temperature

(3) - specific conductivity corrected to 25 degrees C.

TABLE 9: WATER QUALITY CRITERIA - UPDATED 2000

Parameter	Acute Aquatic Criteria		Chronic Aquatic Criteria		Human Health		MCL	
TCL Volatiles (ug/L)								
Acetone	10000	+	222	+	--		--	
Benzene	5300	E	118	+	400	I	5	E
Chlorobenzene	1950	+	50	E	2026	+	--	
1,2-Dichloroethene (total) (1)	--		--		--		70 and 100	E
Methylene Chloride	193000	E	4289	+	157	E	--	
Toluene	17500	E	389	+	424000	I	1000	E
Trichloroethene	45000	E	21900	E	807	I	5	E
Vinyl Chloride	--		--		5246	I	2	E
TCL Semivolatiles (ug/L)								
Phenol	10200	E	2560	E	3500	E	--	
Phthalate Esters	940	E	3	E	50000	I	--	
TAL Metals and Cyanide (ug/L)								
Aluminum	--		--		--		--	
Antimony	--		--		45000	I	6	E
Arsenic	360	I	190	I	0.175	I	50	E
Barium	--		--		--		2000	E
Beryllium	--		--		1.17	I	4	E
Cadmium*	6.7	I	1.6	I	60	+	5	E
Calcium	--		--		--		--	
Chromium	16	I	11	I	3389	+	100	E
Cobalt	--		--		--		--	
Copper* (2)	28	I	18	I	--		1300	E
Cyanide	22	I	5.2	I	24242	+	200	E
Iron	1000	E	--		--		--	
Lead* (2)	150	I	5.8	I	51	+	15	E
Magnesium	--		--		--		--	
Manganese	--		--		--		--	
Mercury	2.4	I	0.012	I	0.15	I	2	E
Nickel*	2100	I	240	I	100	I	100	E
Potassium	--		--		--		--	
Selenium	130	I	25	I	--		50	E
Silver*	9.2	I	0.12	E	--		50	E
Sodium	--		--		--		--	
Thallium	--		--		48	I	2	E
Vanadium	11000	+	100	+	--		--	
Zinc*	175	I	160	I	--		--	
IDEM Parameters (mg/L)								
Ammonia, Total Unionized**	0.027	I	0.0029	I	--		--	
COD	--		--		--		--	
Chloride	860	I	230	I	--		--	
TSS	--		--		--		--	

Notes:

*Acute and chronic criteria calculated based on worst-case hardness=161 mg/L
**Acute and chronic criteria calculated based on worst-case t=5C, pH=7.0
-- Criteria not developed
MCL - Maximum Contaminant Level (Updated per the Safe Drinking Water Act of 1986 and later revisions known as the Phase I, Phase II, and Phase V rules. Phase I became effective January 9, 1989, Phase II became effective in 1992, and Phase V became effective January 17, 1994.)
Source of Data
E - U.S. EPA
I - IDEM (327 IAC 2)
+ - See section 6.2 of February 1990 report by Beak Consultants Limited Baseline Water Quality Conditions for discussion of sources for the criteria.
(1) The 1,2-Dichloroethene MCL standards are divided into cis-1,2-Dichloroethene at 70 ug/L and trans-1,2 Dichloroethene at 100 ug/L.
(2) - The "MCL" value is an action level for lead and copper (i.e., the lead and copper rule) but it only applies to water supplies as measured at the household tap.

TABLE 10: CALCULATED ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR AMMONIA-NITROGEN, APRIL 2003

Sample Matrix	Well Number	pH	Temp (C)	Total Ammonia in Sample (mg/L)	Calculated Un-Ionized Ammonia (in Sample) (mg/L)*	Calculated Un-Ionized Ammonia Criteria (mg/L)** AAC	Calculated Un-Ionized Ammonia Criteria (mg/L)** CAC	Criteria Exceeded AAC	Criteria Exceeded CAC
Ground Water	MB-1	7.4	14.0	R	R	0.091	0.0145	R	R
	MB-2	6.9	15.0	7.6	0.0158	0.044	0.0044	No	Yes
	MB-5	7.2	14.5	1.7	0.0076	0.074	0.0095	No	No
	MB-6	7.0	14.5	3.6	0.0088	0.049	0.0053	No	Yes
	MB-7	7.1	15.5	5.1	0.0178	0.064	0.0074	No	Yes
	MB-8	7.2	15.0	4.1	0.0185	0.076	0.0096	No	Yes
	MB-9	7.7	13.5	0.43	0.0057	0.117	0.0288	No	No
	MB-10	7.2	13.0	0.10 U	0.0002	0.067	0.0088	No	No
	Duplicate+	7.4	14.0	R	R	0.091	0.0145	R	R
Pond Water	On-site (S)	8.0	22.5	0.10 U	0.0024	0.257	0.1044	No	No
Surface Water	SW-1	8.2	23.0	0.10 U	0.0036	0.283	0.1563	No	No
	Duplicate++	8.2	23.0	0.10 U	0.0036	0.283	0.1563	No	No
	SW-5	8.4	21.0	0.10 U	0.0044	0.257	0.1967	No	No
	SW-6	9.3	21.0	0.10 U	0.0227	0.283	1.7133	No	No

Notes:

* - Values calculated according to the Indiana Register (1990) (327 IAC 2). Unionized values calculated using 1/2 the detection limit for less than detection limit total results.

** - Calculated according to the USEPA Quality Criteria for Water, 1986 EPA 440/5-86-001(as revised by Water Quality Criteria and Standards Activity Report, August 1992)

+ - Readings taken from monitoring well MB-1

++ - Readings taken from surface water sample location SW-1.

AAC - Acute Aquatic Criteria

CAC - Chronic Aquatic Criteria

TABLE 11: ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR TAL METALS
CONCENTRATIONS DEPENDENT ON HARDNESS, APRIL 2003

Sample Matrix	Sample Location	Hardness (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Cadmium (ug/L)				Chromium (ug/L)				Copper (ug/L)				Lead (ug/L)				Nickel (ug/L)				Silver (ug/L)			Zinc (ug/L)			
					Sample Conc.**		AAC*	CAC*	Sample Conc.**		AAC*	CAC*	Sample Conc.**		AAC*	CAC*	Sample Conc.**		AAC*	CAC*	Sample Conc.**		AAC*	CAC*	Sample Conc.**		AAC*	CAC(1)*	Sample Conc.**		AAC*	CAC*
Dissolved Metals																															
Ground Water	MB-1	437.4	119.0	34.0	0.20	U	21	4	0.7	U	5815	683	1.6	U	71	42	1.4	U	534	21	3.7	J	4943	549	0.90	U	51		1.5	U	409	370
	MB-2	578.8	167.0	38.2	0.20	U	28	5	0.8	U	7316	872	1.8	U	93	53	1.4	U	783	30	2.4	J	6284	696	0.90	U	63		1.5	U	518	466
	MB-5	470.6	98.2	64.7	0.20	U	23	4	0.7	U	6174	736	1.8	U	76	44	1.4	U	586	23	2.7		5256	585	0.90	U	56		1.5	U	435	394
	MB-8	428.8	121.0	30.2	0.20	U	20	4	1.1	U	5699	679	1.6	U	70	41	1.4	U	518	20	12.5		4941	538	0.90	U	49		1.5	U	400	362
	MB-7	361.5	88.9	31.4	0.20	U	16	3	1.1	U	4881	579	1.6	U	58	35	1.4	U	404	16	1.2	J	4107	457	0.90	U	35		1.5	U	339	307
	MB-8	530.1	92.7	72.6	0.20	U	26	4	1.6	U	6807	811	1.6	U	86	49	1.4	U	662	27	2.6	J	5615	646	0.90	U	71		1.5	U	481	436
	MB-9	232.6	57.0	21.9	0.20	U	10	2	0.6	U	3467	413	1.6	U	36	24	1.4	U	236	9	1.2	U	2887	322	0.90	U	17		1.5	U	239	217
	MB-10	425.7	112.0	36.4	0.20	U	20	4	0.6	U	5667	678	1.6	U	69	41	1.4	U	516	20	1.4	J	4830	537	0.90	U	49		1.5	U	399	362
	Duplicate +	437.4	119.0	34.0	0.20	U	21	4	1.1	U	5815	683	1.6	U	71	42	1.4	U	534	21	2.4	J	4943	549	0.90	U	51		1.5	U	409	370
Pond Water	On-site (6)	223.3	46.2	28.8	1.2		10	2	0.7	U	3383	400	9.9	J	38	23	2.7	U	227	9	6.6	U	2798	311	0.90	U	16		38.1		231	209
Surface Water	SW-1	315.1	74.2	31.5	5.0	U	14	3	0.70	U	4446	530	2.3	J	52	32	R		352	14	3.9	U	3745	416	0.80	U	29		8.5	U	309	280
	Duplicate++	316.5	74.4	31.7	0.40	U	14	3	0.70	U	4461	532	28.0	U	52	32	R		354	14	1.9	U	3758	418	0.80	U	29		8.5	U	311	281
	SW-5	319.8	76.1	32.1	0.40	U	16	3	0.70	U	4500	536	2.3	U	53	32	2.7	U	369	14	2.9	U	3783	422	0.80	U	30		8.5	U	313	284
	SW-6	363.1	90.1	33.8	0.40	U	17	3	0.70	U	4993	595	2.3	U	60	36	2.7	U	422	16	2.4	U	4222	489	0.80	U	37		8.5	U	348	316

Notes:
* - Values calculated according to the Indiana Register (1990) (327 IAC 2).
** - Sample concentrations are ug/L (ppb)
AAC - Acute Aquatic Criteria
CAC - Chronic Aquatic Criteria
+ - Duplicate sample collected from monitoring well MB-1.
++ - Duplicate sample collected from surface water sampling location SW-1.
(1) No CAC is calculated for silver.

TABLE 12: SAMPLING LOCATIONS EXCEEDING APPLICABLE WATER QUALITY CRITERIA, APRIL 2003

Parameter	Matrix	Sample Location	Monitoring Well Zone (1)	Sample Concentration (ug/L)	Criterion Exceeded	Criterion Concentration (ug/L)	Source	Average (1) Concentration Of Zone (ug/L)	Exceeds Criterion	Concentration After Mixing (ug /L) (2)	Exceeds Criterion
TCL Volatiles (ug/L)											
Trichloroethane	Groundwater	MB-1	I	60	MCL	5	E	33	Yes	0.02	No
Trichloroethane	Groundwater	Duplicate	I	71	MCL	5	E	38	Yes	0.02	No
Dissolved TAL Metals											
Arsenic	Groundwater	MB-1	I	6.0	HH	0.175	I	41.9	Yes	0.02	No
Arsenic	Groundwater	MB-2	I	77.7	HH	0.175	I	41.9	Yes	0.02	No
Arsenic	Groundwater	MB-5	II	33.4	HH	0.175	I	77.7	Yes	0.04	No
Arsenic	Groundwater	MB-6	II	122	HH	0.175	I	77.7	Yes	0.04	No
Arsenic	Groundwater	MB-7	III	64.1	HH	0.175	I	91.1	Yes	0.05	No
Arsenic	Groundwater	MB-8	III	118	HH	0.175	I	91.1	Yes	0.05	No
Arsenic	Groundwater	MB-9	NA	6.2	HH	0.175	I	–	–	–	–
Arsenic	Groundwater	Duplicate	I	6.5	HH	0.175	I	41.9	Yes	0.02	No
Arsenic	Groundwater	MB-2	I	77.7	MCL	50	E	41.9	No	0.02	No
Arsenic	Groundwater	MB-6	II	122	MCL	50	E	77.7	Yes	0.04	No
Arsenic	Groundwater	MB-7	III	64.1	MCL	50	E	91.1	Yes	0.05	No
Arsenic	Groundwater	MB-8	III	118	MCL	50	E	91.1	Yes	0.05	No
Iron	Groundwater	MB-1	I	1670	AAC	1000	E	14285	Yes	8	No
Iron	Groundwater	MB-2	I	26900	AAC	1000	E	14285	Yes	8	No
Iron	Groundwater	MB-5	II	9410	AAC	1000	E	12905	Yes	7	No
Iron	Groundwater	MB-6	II	16400	AAC	1000	E	12905	Yes	7	No
Iron	Groundwater	MB-7	III	8300	AAC	1000	E	9250	Yes	5	No
Iron	Groundwater	MB-8	III	10200	AAC	1000	E	9250	Yes	5	No
Iron	Groundwater	MB-9	NA	2210	AAC	1000	E	–	–	–	–
Iron	Groundwater	Duplicate	I	1660	AAC	1000	E	14285	Yes	8	No
Indicator Parameters				(mg/L)		(mg/L)		(mg/L)		(mg/L)	
Unionized	Groundwater	MB-2	I	0.0158	CAC	0.0029	E	0.0079	Yes	0.000004	No
Ammonia (mg/L)	Groundwater	MB-5	II	0.0076	CAC	0.0029	E	0.0082	Yes	0.000005	No
	Groundwater	MB-6	II	0.0088	CAC	0.0029	E	0.0082	Yes	0.000005	No
	Groundwater	MB-7	III	0.0178	CAC	0.0029	E	0.0182	Yes	0.000010	No
	Groundwater	MB-8	III	0.0185	CAC	0.0029	E	0.0182	Yes	0.000010	No
	Groundwater	MB-9	NA	0.0057	CAC	0.0029	E	–	–	–	–

Notes:

AAC - Acute Aquatic Criteria
CAC - Chronic Aquatic Criteria
Duplicate - Duplicate sample collected from monitoring well MB-1
NA - Not applicable; sampling location is not included in the monitoring zone calculations.
HH - Human Health Criteria
MCL - Maximum Contaminant Level

(1) Refer to the Environmental Resources Management (ERM) Remedial Action Plan for Marion (Bragg) Landfill Site, Marion, Indiana, dated 1989, for definition of monitoring well zones and concentration calculations. Monitoring well zone I will consist of MB-1 and MB-2 with condensed monitoring program, since MB-3 and MB-4 have been removed from the sampling program.

(2) Refer to the Camp, Dresser, and McKee (CDM) Remedial Investigation Report, dated 1987, for mixing zone calculations.

APPENDIX A

Chain-of-Custody Forms

CHAIN-OF-CUSTODY RECORD

No. 65173 1 of 5

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

Project Name : Ingram Barn	Client Address : C [illegible]	Point-of-Contact : [illegible]
Carrier : Fedex	[illegible]	Telephone No. : [illegible]
Airbill No. : 8[illegible]6		Sampling complete? Y or N (see Note 1)
Sampler Name : [illegible]	Sampler Signature : [illegible]	Project-specific (PS) or Batch (B) QC ? ____

BOX #1	1. Surface Water	6. Trip Blank	BOX #2	A. HCl + Ice	F. Ice Only	BOX #3	F. Filtered	Box #4	H. High	Box #5	C. CLP 3/90	T. TCLP
	2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other____		U. Unfiltered		M. Medium		S. SW-846	
	3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice				L. Low		W. CWA 600-series	
	4. Rinsate	9. Other Field blk		D. H2SO4 + Ice	I. ZnAc+NaOH + Ice						O. Other____	
	5. Soil / Sediment / Sludge			E. Unpreserved	J [illegible]							

Sample ID (9 characters maximum)	Date: Year 00	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH3N	TKN	Remarks / Comments (see Notes 2 & 3)
SW01VB	11/30	15:10	A1	J	F,U	L	5	2		X	X				X				X	X	X	[illegible]
SW01DUP	11	:	1	J	U			2		X	X				X				/	/	/	[illegible]
SW01MS	11	:	1	J	U			2		X	X				X				/	/	/	[illegible]
SW01MSD	11	:	1	J	U			2		X	X				/				/	/	/	[illegible]
DUP1	11	16:15	1	B,D,F	U			6			X				X				X	/	/	[illegible]
EB01	11	17:00	1	B,D,F	U			6			X				X				X	X	X	[illegible]
EB01TOC	11/30	11:40	6	A	U			3		X												
SW02	11/30	16:20	1	B,D,F	F,U			6			X				X				X	X	X	
GW01FB	11/30	11:50	7	J	F,U	L	5	2		X	X				X				X	X	X	
GW01OTB	11/30	11:40	6	A	U	L	5	3		X												

Clients Special Instructions: [illegible] Temperature ____ °C

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) [illegible] Date: 11/30	#2 Relinquished By: (Sig) Date:	#3 Relinquished By: (Sig) Date:
Company Name: CPI Inc Time: 18:00	Company Name: Time:	Company Name: Time:
#1 Received By: (Sig) Date:	#2 Received By: (Sig) Date:	#3 Received By: (Sig) Date:
Company Name: Time:	Company Name: Time:	Company Name: Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge.
Note (3): All lab copies of data destroyed after three years.

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 55170

Project Name :	Client Address :	Point-of-Contact :
Carrier :		Telephone No. :
Airbill No. :		Sampling complete? Y or N (see Note 1)
Sampler Name :	Sampler Signature :	Project-specific (PS) or Batch (B) QC ?

BOX #1	1. Surface Water	6. Trip Blank	BOX #2	A. HCl + Ice	F. Ice Only	BOX #3	F. Filtered	Box #4	H. High	Box #6	C. CLP 3/90	T. TCLP
	2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other_____		U. Unfiltered		M. Medium		S. SW-846	
	3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice				L. Low		W. CWA 600-series	
	4. Rinsate	9. Other_____		D. H2SO4 + Ice	I. ZnAc+NaOH + Ice						O. Other_____	
	5. Soil / Sediment / Sludge			E. Unpreserved								

Sample ID (9 characters maximum)	Date: Year: 2000	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #6 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	CCl4	NH4	TCLP	Remarks / Comments (see Notes 2 & 3)
	4/3	08:20	2	LDF	C	L	T	6			X				X							
	1	0912																				
	1	01:15																				
	1	10:15																				
	1	11:00																				
	1	11:15																				
	1	13:20		↓				↓														
	1	14:00		F				2		X												
	1	1:1		↓				↓		↓												
	1	↓	↓	↓	↓	↓	↓	↓		↓	↓				↓				↓	↓	↓	

Clients Special Instructions: Temperature _____ °C

Lab: Received in Good Condition? Y or N **Describe Problems, If any:**

#1 Relinquished By: (Sig) Date: 4/4	#2 Relinquished By: (Sig) Date:	#3 Relinquished By: (Sig) Date:
Company Name: Time: 12	Company Name: Time:	Company Name: Time:
#1 Received By: (Sig) Date:	#2 Received By: (Sig) Date:	#3 Received By: (Sig) Date:
Company Name: Time:	Company Name: Time:	Company Name: Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

CHAIN-OF-CUSTODY RECORD

No. 55174

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

Project Name :	Client Address :	Point-of-Contact :
Carrier : Fed Ex		Telephone No. :
Airbill No. :		Sampling complete? Y or N (see Note 1)
Sampler Name :	Sampler Signature :	Project-specific (PS) or Batch (B) QC ?

BOX #1	1. Surface Water	6. Trip Blank	BOX #2	A. HCl + Ice	F. Ice Only	BOX #3	F. Filtered	Box #4	H. High	Box #5	C. CLP 3/90	T. TCLP
	2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other_____		U. Unfiltered		M. Medium		S. SW-846	
	3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice				L. Low		W. CWA 600-series	
	4. Rinsate	9. Other_____		D. H2SO4 + Ice	I. ZnAc+NaOH + Ice						O. Other_____	
	5. Soil / Sediment / Sludge			E. Unpreserved								

Sample ID (9 characters maximum)	Date: Year:	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH				Remarks / Comments (see Notes 2 & 3)
	/	:																				
	/	:																				
	/	:																				
	/	:																				
	/	:																				
	/	:																				
	/	:																				
	/	:																				
	/	:																				
	/	:																				

Clients Special Instructions: Temperature _____ °C

Lab: Received In Good Condition? Y or N **Describe Problems, If any:**

#1 Relinquished By: (Sig)	Date:	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name:	Time:	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date:	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name:	Time:	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

COMPUCHEM

Login Chain of Custody Report (ln01)

May. 01, 2003 *05:53 PM*

Login Number: RZ1067

Account: O & M O & M

Project: MARION BRAGG

Case: Q1067

Laboratory Sample Number		Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
RZ1067-1		GW09FBPB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	3	Bottles	
RZ1067-2		GW07PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	3	Bottles	
RZ1067-3		GW08PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**USE FOR QC
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	3	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	3	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	3	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	6	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	9	Bottles	
RZ1067-4		GW08DPPB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	3	Bottles	
RZ1067-5		GW01PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			

Signature : _____

Date : 5/2/03

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COMPUCHEM

Login Chain of Custody Report (ln01)

May. 01, 2003 *05:53 PM*

Login Number: RZ1067

Account: O & M O & M

Project: *MARION BRAGG*

Q1067

Laboratory Sample Number		Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
RZ1067-6		GW02PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
RZ1067-7		GW03PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**LOW VOLUME
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	1	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
RZ1067-8		GW04PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
RZ1067-9		GW05PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
RZ1067-10		GW06PB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S	AMMONIA (AS N)	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold 28-MAY-03	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.0	Hold: 28-MAY-03	plastic liter	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S	TSS	Hold: 07-MAY-03	plastic liter			
RZ1067-11		GW01TBPB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**TRIP BLK
Water	S	VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	3	Bottles	

Signature : _____ 90

Date : 5/2/03

COMMERCIAL RECEIVING LOG

Client:	O'H, Inc
Project:	Marion Bragg
Quote:	11067
Login No.	RY 04 11067
Subcontract?	Y / N (CEI) COD to CET
TAT Verbal	Report 13 days
Rec'd Date:	5-1-03
Courier:	Fed Ex
Airbill No.	8253 6677 9080
PPS/RFA	489
Lab Instructions	COD subbed to CET

Cooler Rec'd By:	E Schiller
Sample Login By:	Kelly Dorn
Temperature:	2.0 → 6.5 °C
Cyanide Samples checked for sulfide & chlorine?	Y / (NA)
Phenol Samples checked for chlorine?	Y / (NA)
Received in Good Condition?	(Y) / N
If no, explain:	

CompuChem ID	Client ID	QC	Matrix	Date 2003	Military Time	Parameters: COD No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
RY1067-1	SW01 PB	X	WA	04/29	15:10	3.250PL															
-2	01 DPPB			/	15:10	1.250PL															
-3	02 PB			/	16:45																
-4	03			/	17:00																
-5	PW 01			/	16:20																
RA-1067-1	GW 09FB			/ 30	11:30																
-2	01			/	~~11:45~~ 08:29																
-3	03			/	09:45																
-4	04			/	10:15																
-5	05			/	11:00																
-6	06			/	11:45																
-7	07			/	13:20																
-8	08			/	14:00	3.250PL															
-9	08 DP	X	X	/	14:00	1.250PL															

Container Type Abbreviations 40mL(40mL vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER _____

COMMERCIAL RECEIVING LOG

Client: O&M Inc.	Rec'd Date: 5-1-03	PPS/RFA 489	Lab Instructions
Project: Marion Drogg	Courier: hand Et		
Quote: RX1067	Airbill No. 8253 6077 9050		
Login No. RX1067, RZ1067			
Subcontract? Y / N			
TAT Verbal Report 13 days			

Cooler Rec'd By:	
Sample Login By:	
Temperature: 2.0 °C to 6.0 °C	
Cyanide Samples checked for sulfide & chlorine? Y / (NA)	
Phenol Samples checked for chlorine? Y / (NA)	
Received in Good Condition? (Y) / N	
If no explain:	

CompuChem ID	Client ID	QC	Matrix	Date 2003	Military Time	Parameters: VOC No. & Type	pH	SVOC No. & Type	pH	Metals No. & Type	pH	Ammonia No. & Type	pH	CL TSS No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
RX1067-1	SW01PB	X	WA	Apr 29	15:10	9:40ml		6:AL		3:PL	<2	3:PL	<2	3:PL							
-2	01DPPB			/	15:10	3:40ml		2:AL		1:PL		1:PL		1:PL							
-3	02PB			/	16:55	—		↓		↓		↓		↓							
-4	03 ↓			/	12:00	—															
-6	04TBPB			/	30 11:40	3:40ml		—		—		—		—							
-5	RW 01PB			/	29 16:20	—		2:AL		1:PL	<2	1:PL	<2	1:PL							
RZ1067-1	EW 09FBPB			/	30 11:30	3:40ml		↓		↓		↓		↓							
-11	10TBPB			/	11:45	↓		—		—		—		—							
-5	01PB			/	08:20	—		2:AL		1:PL	<2	1:PL	<2	1:PL							
-6	02			/	09:00	—		↓													
-7	03			/	09:45	—		1:AL													
-8	04			/	10:15	—		2:AL													
-9	05			/	11:00	—															
-10	06			/	11:45	—															
-2	07			/	13:20	3:40ml w/ bubbles		↓		↓		↓		↓							
-3	08 ↓	X		/	14:00	4:40ml w/ bubbles		6:AL		3:PL		3:PL		3:PL							
-4	08DPPB			/	14:00	3:40ml		2:AL		1:PL		1:PL		1:PL							
				/																	
00				/																	
00				/																	

Container Type Abbreviations 40ml(40ml. vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER

FL-6 2880 doc

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem

Matrix: H_2O

Request Date: 5/6/03

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RZ1067-1	5/1/03	AMMONIA (AS N)	H_2SO_4	1 of 1
2	RZ1067-2	5/1/03	AMMONIA (AS N)		1 of 1
3	RZ1067-3	5/1/03	AMMONIA (AS N)		3 of 3
4	RZ1067-4	5/1/03	AMMONIA (AS N)		1 of 1
5	RZ1067-5	5/1/03	AMMONIA (AS N)		1 of 1
6	RZ1067-6	5/1/03	AMMONIA (AS N)		1 of 1
7	RZ1067-7	5/1/03	AMMONIA (AS N)		1 of 1
8	RZ1067-8	5/1/03	AMMONIA (AS N)		1 of 1
9	RZ1067-9	5/1/03	AMMONIA (AS N)		1 of 1
10	RZ1067-10	5/1/03	AMMONIA (AS N)		1 of 1
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By: [signature] Received By: [signature] Date: 5/6/03 Time: 8:45

Relinquished By: [signature] Received By: [signature] Date: 5-6-03 Time: 16:15

Relinquished By: _____ Received By: _____ Date: _____ Time: _____

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem

Matrix: H_2O

Request Date: 5/5/03

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RZ1067-1	5/1/03	CHLORIDE	NONE	1 of 1
2	RZ1067-2	5/1/03	CHLORIDE		1 of 3
3	RZ1067-3	5/1/03	CHLORIDE		2 of 3
4	RZ1067-4	5/1/03	CHLORIDE		1 of 1
5	RZ1067-5	5/1/03	CHLORIDE		1 of 1
6	RZ1067-6	5/1/03	CHLORIDE		1 of 1
7	RZ1067-7	5/1/03	CHLORIDE		1 of 1
8	RZ1067-8	5/1/03	CHLORIDE		1 of 1
9	RZ1067-9	5/1/03	CHLORIDE		1 of 1
10	RZ1067-10	5/1/03	CHLORIDE		1 of 1
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By: _____ Received By: _____ Date: 5/5/03 Time: 8:45

Relinquished By: _____ Received By: cooler #1 Date: 5/5/03 Time: 6:50

Relinquished By: _____ Received By: _____ Date: _____ Time: _____

COMPUCHEM

Login Chain of Custody Report (ln01)

May. 01, 2003 *05:34 PM*

Login Number: RX1067

Account: O & M O & M

Project: MARION BRAGG

Case: Q1067

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
RX1067-1	SW01PB	29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**USE FOR QC
Water	S AMMONIA (AS N)	Hold: 27-MAY-03	plastic liter	3	Bottles	
Water	S CHLORIDE	Hold: 27-MAY-03	plastic liter	3	Bottles	
Water	S METALS-DISS-ILM04.0	Hold: 27-MAY-03	plastic liter	3	Bottles	
Water	S STORAGEBLK	Hold:	storageblk(40mlvial)	2	Bottles	
Water	S SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	6	Bottles	
Water	S TSS	Hold: 06-MAY-03	plastic liter			
Water	S VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	9	Bottles	
RX1067-2	SW01DPPB	29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S AMMONIA (AS N)	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S CHLORIDE	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S METALS-DISS-ILM04.0	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S TSS	Hold: 06-MAY-03	plastic liter			
Water	S VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	3	Bottles	
RX1067-3	SW02PB	29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S AMMONIA (AS N)	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S CHLORIDE	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S METALS-DISS-ILM04.0	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S TSS	Hold: 06-MAY-03	plastic liter			
RX1067-4	SW03PB	29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S AMMONIA (AS N)	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S CHLORIDE	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S METALS-DISS-ILM04.0	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S TSS	Hold: 06-MAY-03	plastic liter			
RX1067-5	PW01PB	29-APR-03	01-MAY-03	9	14-MAY-03	PPS 489
Water	S AMMONIA (AS N)	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S CHLORIDE	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S METALS-DISS-ILM04.0	Hold: 27-MAY-03	plastic liter	1	Bottles	
Water	S SVOA-OLM04.2	Hold: 06-MAY-03	amber liter	2	Bottles	
Water	S TSS	Hold: 06-MAY-03	plastic liter			
RX1067-6	SW04TBPB	30-APR-03	01-MAY-03	9	14-MAY-03	PPS 489**TRIP BLK
Water	S VOA-OLM04.2-5ML	Hold: 11-MAY-03	40ml vial	3	Bottles	

Signature : Cathy Dorey

Date : 5/2/03

COMPUCHEM a Division of Liberty Analytical

COMMERCIAL RECEIVING LOG

Client: O'Brien, Inc
Project: Marion Bragg
Quote: RJ1067
Login No. RJ1067
Subcontract? Y / (N) COD to CET
TAT Verbal Report 13 days

Rec'd Date: 5-1-03
Courier: Fed Ex
Airbill No. 8253 6077 9080

PPS/RFA 489

Lab Instructions
COD subbed to CET

Cooler Rec'd By: E Schiller
Sample Login By: Kelly Dorn
Temperature: 2.0 → 6.0 °C
Cyanide Samples checked for sulfide & chlorine? Y / (NA)
Phenol Samples checked for chlorine? Y / (NA)
Received in Good Condition? (Y) / N
If no, explain:

CompuChem ID	Client ID	QC	Matrix	Date 2003	Military Time	Parameters: No. & Type (COD)	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
RJ1067-1	SW01 PB	X	WA	04/29	15:10	3.250PL															
-2	01 DPPB			/	15:10	1.250PL															
-3	02 PB			/	16:45																
-4	03			/	17:00																
-5	PW 01			/	16:20																
RA-1067-1	GW 09FB			/30	11:30																
-2	01			/	~~11:45~~ 08:25																
-3	03			/	09:45																
-4	04			/	10:15																
-5	05			/	11:00																
-6	06			/	11:45																
-7	07			/	13:20																
-8	08			/	14:00	3.250PL															
-9	08 DF	X		/	14:00	1.250PL															

Does settle

Container Type Abbreviations: 40ml(40ml Vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER

rlt - 6/28/01 use

COMPUCHEM a Division of Liberty Analytical

COMMERCIAL RECEIVING LOG

PPS/RFA 489

Client: O'Brien Inc.
Project: Marion Bragg
Quote: RX1067
Login No. RX1067, RZ1067
Subcontract? Y / N
TAT Verbal Report 13 days

Rec'd Date: 5-1-03
Courier: fed ex
Airbill No. 8253 6077 9080

Lab Instructions

Cooler Rec'd By: [signature]
Sample Login By: [signature]
Temperature: 2.0 → 6.0 °C
Cyanide Samples checked for sulfide & chlorine? Y / (NA)
Phenol Samples checked for chlorine? Y / (NA)
Received in Good Condition? (Y) / N
If no explain:

CompuChem ID	Client ID	QC	Matrix	Date 2003	Military Time	Parameters: VOC No. & Type	pH	SVOC No. & Type	pH	Metals No. & Type	pH	Ammonia No. & Type	pH	CL TSS No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
RX1067-1	SW 01 PB	X	WA	04/29	15:10	9-40ml		6-AL		3-PL	<2	3-PL	<2	3-PL							
-2	01DPPB			/	15:10	3-40ml		2-AL		1-PL		1-PL		1-PL							
-3	02 PB			/	16:45	—		↓		↓		↓		↓							
-4	03 ↓			/	19:00	—		↓		↓		↓		↓							
-6	↓ 04TB PB			/	30 11:40	3-40ml		—		—		—		—							
-5	PW 01 PB			/	29 16:20	—		2-AL		1-PL	<2	1-PL	<2	1-PL							
RZ1067-1	EW 09 FB PB			/	30 11:30	3-40ml		↓		↓	↓	↓	↓	↓							
-11	10TB PB			/	11:45	↓		—		—	-	—	—	—							
-5	01 PB			/	08:20	—		7-AL		1-PL	<2	1-PL	<2	1-PL							
-6	02			/	09:00	—		↓													
-7	03			/	09:45	—		1-AL													
-8	04			/	10:15	—		2-AL													
-9	05			/	11:00	—															
-10	06			/	11:45	—															
-2	07			/	13:20	3-40ml vials		↓		↓		↓		↓							
-3	08 ↓	X		/	14:00	4-40ml vials		6-AL		3-PL		3-PL		3-PL							
-4	↓ 08DPPB		↓	↓	/	14:00	3-40ml		2-AL		1-PL	↓	1-PL	↓	1-PL						
8					/																

Container Type Abbreviations: 40ml(40ml vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER

rll - 6/28/01 doc

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem

Matrix: H_2O

Request Date: 5/6/03

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RX1067-1	5/1/03	AMMONIA (AS N)	H_2SO_4	3 of 3
2	RX1067-2	5/1/03	AMMONIA (AS N)		1 of 1
3	RX1067-3	5/1/03	AMMONIA (AS N)		1 of 1
4	RX1067-4	5/1/03	AMMONIA (AS N)		1 of 1
5	RX1067-5	5/1/03	AMMONIA (AS N)		1 of 1
6					of
7					of
8					of
9					of
10					of
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By: BJB — Received By: [signature] Date: 5/6/03 Time: 8:45

Relinquished By: [signature] — Received By: Coolerwt Date: 5-6-03 Time: 16:15

Relinquished By: _____ — Received By: _____ Date: _____ Time: _____

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem Matrix: H_2O

Request Date: 5/5/03

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RX1067-1	5/1/03	CHLORIDE	NONE	2 of 3
2	RX1067-2	5/1/03	CHLORIDE		of
3	RX1067-3	5/1/03	CHLORIDE		of
4	RX1067-4	5/1/03	CHLORIDE		of
5	RX1067-5	5/1/03	CHLORIDE		of
6					of
7					of
8					of
9					of
10					of
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By: [signature] Received By: [signature] Date: 5/5/03 Time: 8:45

Relinquished By: [signature] Received By: cooler #1 Date: 5/5/03 Time: 6.50

Relinquished By: _____ Received By: _____ Date: _____ Time: _____

APPENDIX C

Transportation Airbill

FedEx Express **USA Airbill**

FedEx Tracking Number **825360779080**

Sender's Copy

Please print and press hard.

4/30/03 — Sender's FedEx Account Number: 2431-0147-6

From: P. Buaon — Phone: (317) 718-3688

Company: O & M INC

Address: 105 COMMERCE DR STE B — Dept./Floor/Suite/Room:

City: DANVILLE — State: IN — ZIP: 46122

Internal Billing Reference (characters will appear on invoice.)

Attn: Sample Receiving — Phone: 800 8335097

Company: Compchem

Address: 501 Madison Ave — (* at FedEx location, print FedEx address. We cannot deliver to P.O. boxes or P.O. ZIP codes.)

Dept./Floor/Suite/Room:

City: Cary — State: NC — ZIP: 27513

Peel and Stick FedEx USA Airbill

See back for application instructions.

Questions? Visit our Web site at www.fedex.com

or call 1-800-Go-FedEx® (800)463-3339.

By using this Airbill you agree to the service conditions on the back of this Airbill and in our current Service Guide, including terms that limit our liability.

0165043933

4a Express Package Service — *Packages up to 150 lbs.* Delivery commitment may be later in some areas.

- [X] FedEx Priority Overnight — Next business morning
- [ ] FedEx Standard Overnight — Next business afternoon
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations
- [ ] FedEx 2Day* — Second business day
- [ ] FedEx Express Saver* — Third business day

* FedEx Envelope/Letter Rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.* Delivery commitment may be later in some areas.

- [ ] FedEx 1Day Freight* — Next business day
- [ ] FedEx 2Day Freight — Second business day
- [ ] FedEx 3Day Freight — Third business day

* Call for Confirmation: _____

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope/Letter*
- [ ] FedEx Pak*
- [X] Other Pkg. — Includes FedEx Box, FedEx Tube, and customer pkg.

6 Special Handling — Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — RESTRICTIONS: Available only for FedEx Priority Overnight and FedEx 2Day to select ZIP codes
- [ ] SUNDAY Delivery — RESTRICTIONS: Available only for FedEx Priority Overnight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — RESTRICTIONS: Not available with FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — RESTRICTIONS: Available only for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [X] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 _____ x _____ kg
- [ ] Cargo Aircraft Only

Dangerous Goods cannot be shipped in FedEx packaging.

7 Payment *Bill to:* — Enter FedEx Acct. No. or Credit Card No. below.

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [X] Third Party
- [ ] Credit Card
- [ ] Cash/Check

FedEx Acct. No. / Credit Card No.: 135584 22-3 — Exp. Date:

Total Packages	Total Weight	Total Declared Value†
10	551	$2000.00

†Our liability is limited to $100 unless you declare a higher value. See back for details. — FedEx Use Only

8 Release Signature *Sign to authorize delivery without obtaining signature.*

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

402

Rev. Date 7/00 • Part #156912G • ©1994–2000 FedEx • PRINTED IN U.S.A. GBFE 11/00

PULL AND RETAIN THIS COPY BEFORE AFFIXING TO THE PACKAGE.

FedEx. MPS
30APR 18:53

Pcs: 10
Emp#: 83535
1 of 1
Rt#: STA

825360779080

MASTER TRK#:
Pkg Trk#'s: 793201285312
793201285323
793201285334
793201285345
793201285356
793201285367
793201285378
793201285389
793201285390

Recipient Copy

APPENDIX B

Trillium, Inc.

Data Validation Reports

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

ORGANIC ANALYSIS DATA
Volatiles in Water

SDG Nos. RX1067 and RZ1067
April 2003 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 23, 2003

92241/CAE/DAS
\MARION\Apr03\voc

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the volatile organics analysis data prepared by CompuChem Environmental for five water samples, one field blank, and two trip blanks from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in two separate data packages, under Sample Delivery Group (SDG) Nos. RX1067 and RZ1067, which were received for review on June 12, 2003, with additional information provided on June 30, 2003, and July 22, 2003. The following samples were reported:

SDG No. RZ1067:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW09FBPB (field blank)	GW10TBPB (trip blank)	

SDG No. RX1067:

SW01PB (SW-1)	SW01DPPB (SW-1D)	SW04TBPB (trip blank)

Findings of the validation effort resulted in the following qualifications of reported sample results:

- Results for benzene, toluene, ethylbenzene, styrene, total xylenes, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene in GW08DPPB were qualified as estimated (UJ).
- Results for all target analytes in GW10TBPB were qualified as estimated (UJ).
- Results for acetone and 2-butanone in GW09FBPB were qualified as estimated (J).
- Results for acetone in GW07PB, GW08PB, and GW08DPPB were qualified as estimated (UJ).
- Results for methylene chloride in GW08PB, GW08DPPB, GW07PB, GW10TBPB, GW09FBPB, SW01PB, and SW04TBPB were qualified as less than the CRQL (10 U).
- The result for trichloroethene in GW08PB was qualified as estimated (J).
- The TIC peak reported at RT 15.38 minutes in GW10TBPB was rejected (R).

All "B" qualifiers, applied by the laboratory to indicate the presence of the analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers, as noted above.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered part of both data packages for all future distributions of the volatiles data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis (OLM04.2). Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in accordance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev. 11), "Evaluation of Organics Data for the CLP," (6/96) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

These codes are recorded on the customized data tables in Attachment A and the laboratory's Organic Analysis Data Sheets (Form I, Attachment B) to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The water samples and associated blanks were collected on 4/29-30/03. All sample analyses were performed on 5/8-9/03, which is within the specified 14-day holding time for chemically-preserved water samples. With the exceptions noted below, acceptable pH values of 1 were determined by the laboratory at the time of analysis for each sample, confirming successful chemical preservation. Sample pHs were not documented directly on the chain of custody (COC) records, but were recorded on Water Batch Sheets provided in both data packages.

Elevated pH values were documented for GW08DPPB (pH=4), GW08MSPB (pH=6), and GW08MSDPB (pH=6). Results for all aromatic target analytes (benzene, toluene, ethylbenzene, styrene, total xylenes, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene) in GW08DPPB were qualified as estimated (UJ) because this sample was not properly acidified and was analyzed beyond the required holding time for non-chemically preserved water samples (seven days from collection). Since the pH for the GW08PB was acceptable, no action was taken with regard to the elevated pHs in the aliquots of this sample that were designated for matrix spike analyses.

Acceptable cooler temperatures (2-6°C) on receipt at the laboratory were recorded on both COC records applicable to these samples. The same temperatures were also recorded on the laboratory's receiving logs in both data packages.

Sampler notations on each COC indicate that the samples for volatiles analysis were preserved with hydrochloric acid and iced. Laboratory notations on the COCs state that two of the three vials for SW04TBPB and all 3 vials for GW10TBPB contained pea-sized air bubbles. For the purposes of this validation effort, it was assumed that the laboratory utilized the third, unaffected vial for analysis of SW04TBPB; this assumption was confirmed by the laboratory via email on 6/30/03. Since all three vials for GW10TBPB were affected by substantial air bubbles, results for all target analytes in this sample were qualified as estimated (UJ).

The narratives in both data packages state that all samples were received intact and properly refrigerated. No mention is made of the air bubbles or the elevated pH values.

II. GC/MS Instrument Performance Checks

Three instrument performance checks using bromofluorobenzene (BFB) were run and reported, representing every shift (12-hour period) during which samples or associated standards and quality control samples were analyzed. Results for all three performance checks were acceptable.

III. Calibration

Sample analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as HP59. Several target analytes were manually integrated in one or more of the calibration standards run on this instrument in association with this data set. Each manual integration was correctly performed, properly documented and accurately incorporated into the applicable quantitation report. No system monitoring or internal standard peaks were manually integrated.

A. Initial Calibration (IC)

One ambient purge IC (5/1/03) was associated with the reported sample and quality control analyses. Documentation of all individual IC standards run was present in both data packages and relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported. All RRF values were above the minimum acceptance criterion (0.05). %RSD values were below the 30% maximum acceptance criterion except for bromomethane (38.5%).

The elevated %RSD for bromomethane can be traced to an exceptionally low response in the 200 ppb IC standard; very good consistency is observed among the other four IC standards. Using the 10-100 ppb standards only, an average RRF of 1.234 and an acceptable %RSD value of 8.1% are obtained. Bromomethane was not detected in any of the samples in this data set and the reporting limit is not compromised; therefore, no sample results were qualified based on the reported IC results for this analyte.

B. Continuing Calibration (CC)

Reported site sample and quality control analyses were performed under two CC standards, (5/8/03-10:53 and 5/8/03-19:55). Documentation of both CC standards was present in both data packages and RRF as well as percent difference (%D) values were correctly calculated and accurately reported. All RRFs were above the 0.05 minimum criterion. Reported %D values were less than the maximum acceptance limit of 25% except for bromomethane (40.7%) and acetone (30.0%) in the 5/8/03-10:53 CC, and acetone (52.1%), 2-butanone (29.9%), and 1,2,4-trichlorobenzene (27.7%) in the 5/8/03-19:55 CC.

Compared to the shortened IC curve (10-100 ppb, as discussed in the previous section), acceptable %D values for bromomethane (10.4% and 5.0%) were obtained in both CC standards. Therefore, no action was warranted with respect to this analyte.

The results for acetone and 2-butanone in GW09FBPB were qualified as estimated (J) because they were detected in this sample, which was associated with a CC standard which had elevated %Ds for these compounds. Results for acetone in GW07PB, GW08PB, and GW08DPPB were qualified as estimated (UJ) because, although it was not detected, the %D value for this analyte in the

associated CC standard was substantially above the maximum acceptance limit (i.e., was greater than 50%).

No other positive results were reported for the target analytes listed above in the samples associated with the affected CCs, the RRFs were all acceptable (i.e., were greater than 0.05) in the affected CC standards, and the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). Therefore, no additional qualifiers were applied based on the CC standard results.

IV. Blanks

Two laboratory method blanks (MBs: VBLKNU and VBLKNV) were analyzed with the samples in this data set. Methylene chloride (1 µg/L) and 1,2,4-trichlorobenzene (2 µg/L) were detected in VBLKNU and 1,2,4-trichlorobenzene (2 µg/L) was detected in VBLKNV. Results for methylene chloride in GW10TBPB, SW01PB, and SW04TBPB were qualified as less than the contract required quantitation limit (CRQL, 10 U) because the reported values were less than five times the concentration found in the associated method blank. The "B" qualifiers applied by the laboratory to these results to indicate that these compounds were also present in the associated method blank were removed by the validator.

1,2,4-Trichlorobenzene was not detected in any of the site samples. Therefore, no additional qualifiers were required based on method blank contamination.

One storage blank (VHBLKLS) was also analyzed in association with the site samples. Methylene chloride (1 µg/L) was detected in VHBLKLS. Results for methylene chloride in all samples where it was detected (GW08PB, GW08DPPB, GW07PB, GW10TBPB, GW09FBPB, SW01PB, and SW04TBPB) were qualified as less than the CRQL (10 U) on this basis.

Two trip blanks (GW10TBPB and SW04TBPB) and one field blank (GW09FBPB) were included in this data set. After qualifications based on laboratory blank contamination, acetone (23 µg/L) and 2-butanone (11 µg/L) were found in GW09FBPB. Neither of these target analytes was detected in any of the site samples. Therefore, no sample results required qualification on this basis.

No tentatively identified compounds (TICs) were found in any of the laboratory blanks associated with this data set. TICs reported in GW09FBPB are discussed in Section IX.

V. System Monitoring Compound Recoveries

Recoveries of the three system monitoring compounds in the reported results for all samples and blanks were correctly calculated, accurately reported and within the acceptance limits as documented on the summary forms.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples GW08PB and SW01PB were prepared and analyzed as MS/MSD pairs. Percent recoveries (%R) and relative percent differences (RPDs) between paired recoveries were correctly calculated and accurately reported for both sets of quality control data. The %Rs for all spiked target compounds were acceptable (100-114%) and reproducible (RPDs ≤2) in SW01PBMS/MSD. For GW08PBMS/MSD, recoveries for 1,1-dichloroethene, benzene, toluene, and chlorobenzene were acceptable (100-118%) and reproducible (RPDs ≤2), but recoveries for trichloroethene (140% and 120%; QC 71-120%) unacceptably high or right at the upper limit. The RPD for trichloroethene was also slightly high (15%; QC ≤14%).

In the unspiked analysis of GW08PB, trichloroethene was found at a concentration very close to the spike amount added (60 µg/L in unspiked sample; 50 µg/L added). Accurate recovery should be achievable under these circumstances. Therefore, the result for trichloroethene in GW08PB was qualified as estimated (J) on this basis.

A comparison of results for non-blank-related, unspiked target analytes in GW08PB, the MS, and the MSD was made. Agreement among the three results for cis-1,2-dichloroethene (7.5 %RSD) was very good.

A comparison of results for non-blank-related, unspiked target analytes in SW01PB, the MS, and the MSD was also made. Acetone was found at low concentrations in the MS (3 µg/L) and in the MSD (4 µg/L) but was not found in SW01PB. Since the positive results were both less than the CRQL and this analyte was not reported by the laboratory in the unspiked sample, no action was taken based on these inconsistencies.

VII. Field Duplicate

Sample GW08DPPB was identified as a field duplicate of GW08PB. Agreement between paired results for cis-1,2-dichloroethene (0 RPD), and trichloroethene (16.8 RPD) was acceptable.

Sample SW01DPPB was identified as a field duplicate of SW01PB. After qualifications based on blank contamination, no target analytes were reported in either sample. Therefore, no quantitative evaluation of precision could be made using these data.

VIII. Internal Standard (IS) Performance

All IS areas and retention times were within documented quality control limits for the reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data packages.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations and CRQLs were correctly calculated and accurately reported. No dilutions were required for any of the samples.

"J" qualifiers were appropriately applied by the laboratory to the sample Form Is when the concentration of an analyte was less than the sample-specific quantitation limit. Except where superseded by another qualifier (e.g., "U" at the CRQL), these "J" qualifiers were not removed by the validator.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific quantitation limits may be found on the laboratory-generated Form I for each sample (Attachment B) as well as on the data tables.

XI. Tentatively Identified Compounds (TIC)

Library searches were performed as required for the samples in this data set.

A laboratory artifact at retention time (RT) 15.38 minutes was reported in GW10TBPB. A slightly smaller peak at this RT was observed in the chromatogram for each of the two MBs associated with this data set. Further, based on the library search and the mass spectrum, the artifact appears to be a siloxane compound, which is typically associated with column bleed. Therefore, based on professional judgment, the TIC at 15.38 minutes in GW10TBPB was rejected (R) by the validator.

Two TICs were also reported in GW09FBPB. Neither of these peaks was observed in any of the associated site samples. Therefore, no action was taken by the validator on this basis.

No other TICs were reported in any of the remaining samples in this data set.

XII. System Performance

The GC/MS system appears to have been working satisfactorily at the time of these analyses, based on review of the available raw data.

XIII. Documentation

Three chain of custody (COC) records applicable to these samples were provided for review. The following issues were noted:

- Analysis of VOCs was not specified on the COC for GW07PB.
- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on the COCs.
- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

Sample GW10TBPB (RZ1067-11) was incorrectly identified by the laboratory throughout the data package. On the water batch sheet and in the analysis run logs, it was identified as "GW01TBPB." On all of the summary forms (including Form I) and in the narrative, it was identified as "GW03PB." Where it was identified as GW03PB, the laboratory sample number for GW03PB (RZ1067-7) was also found; on the run log and batch sheet, where it was identified as GW01TBPB, laboratory sample number RZ1067-11 was also recorded. At the validator's request, the laboratory investigated this situation, and determined that the correct sample was actually analyzed. The sample identifications were apparently mixed-up during report preparation. Throughout this report, the sample in question has been correctly identified as GW10TBPB. Corrected data package pages (including page numbers, as indicated below) were provided by the laboratory via FedEx on 7/21/03 as follows:

Narrative - no page numbers *(corrected to pp 3-4)* and pp 48-49
Form I - pp 14-16 *(corrected to pp 11-13)* and pp 93-95 *(corrected to pp 84-86)*
Form II - p 31 and p 70
Form IV - p 35 and p 74
Form V - p 78
Form VIII - p 44 and p 81
Raw Sample Data - pp 96-101 *(corrected to pp 87-92)*

Laboratory-specified page numbers were corrected by the validator as noted above in italics. In each case (with the exception of the narrative), the page numbers indicated by the laboratory would have replaced the pages applicable to GW07PB, which was correctly reported, rather than GW03PB. All of the corrected pages were inserted into the data package for RZ1067 by the validator, replacing the originally-provided pages.

The laboratory-corrected narrative was further corrected by the validator to reflect GW10TBPB (rather than GW03PB) in the third paragraph. In addition, "GW09FPPB" was corrected to "GW09FBPB" in the second and third sentences of the third paragraph.

These documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIV. Overall Assessment

Results for volatile compounds in the samples reported in SDG Nos. RX1067 and RZ1067 were qualified as follows based on the validation effort:

- Results for benzene, toluene, ethylbenzene, styrene, total xylenes, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene in GW08DPPB were qualified as estimated (UJ) because this sample was not properly acidified and was analyzed beyond the required holding time for non-chemically preserved water samples.

- Results for all target analytes in GW10TBPB were qualified as estimated (UJ) because all three sample vials contained substantial air bubbles on receipt at the laboratory.

- Results for acetone and 2-butanone in GW09FBPB were qualified as estimated (J) based on unacceptable %D values in the associated CC standard.

- Results for acetone in GW07PB, GW08PB, and GW08DPPB were qualified as estimated (UJ) based on an unacceptable %D value in the associated CC standard.

- Results for methylene chloride in all samples where it was detected (GW08PB, GW08DPPB, GW07PB, GW10TBPB, GW09FBPB, SW01PB, and SW04TBPB) were qualified as less than the CRQL (10 U) based on contamination in the association method and/or storage blanks.

- The result for trichloroethene in GW08PB was qualified as estimated (J) due to unacceptably high recoveries in the matrix spike analyses.

- The TIC peak reported at RT 15.38 minutes in GW10TBPB was rejected (R) based on its identification as a laboratory artifact and professional judgment.

All "B" qualifiers, applied by the laboratory to indicate the presence of the analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers, as noted above.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered part of both data packages for all future distributions of the volatiles data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
SDG Nos. RX1067 and RZ1067
Volatiles in Water - Marion Bragg, April 2003

Marion Bragg Landfill - April 2003 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point ==========>		MB-1	MB-1D	MB-2	Field Blank
Sample ID ==========>		GW08PB	GW08DPPB	GW07PB	GW09FBPB
Lab Sample No. ==========>		RZ1067-3	RZ1067-4	RZ1067-2	RZ1067-1
Collection Date. ==========>		4/30/03	4/30/03	4/30/03	4/30/03
	CRQL				
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	2 J	10 U
Bromomethane	10	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U
Acetone	10	10 UJ	10 UJ	10 UJ	23 J
Carbon Disulfide	10	10 U	10 U	1 J	10 U
Methyl acetate	10	10 U	10 U	10 U	10 U
Methylene chloride	10	10 U	10 U	10 U	10 U
trans-1,2-dichloroethene	10	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	10	7 J	7 J	10 U	10 U
2-Butanone	10	10 U	10 U	10 U	11 J
Chloroform	10	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 UJ	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U
Trichloroethene	10	60 J	71	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 UJ	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 UJ	0.8 J	10 U
Ethylbenzene	10	10 U	10 UJ	10 U	10 U
Total Xylenes	10	10 U	10 UJ	10 U	10 U
Styrene	10	10 U	10 UJ	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 UJ	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 UJ	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 UJ	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 UJ	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 UJ	10 U	10 U

Marion Bragg Landfill - April 2003 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point ==========>		Trip Blank	SW-1	SW-1D	Trip Blank
Sample ID ==========>		GW10TBPB	SW01PB	SW01DPPB	SW04TBPB
Lab Sample No. ==========>		RZ1067-11	RX1067-1	RX1067-2	RX1067-6
Collection Date. ==========>		4/30/03	4/29/03	4/29/03	4/29/03
	CRQL				
Dichlorodifluoromethane	10	10 UJ	10 U	10 U	10 U
Chloromethane	10	10 UJ	10 U	10 U	10 U
Vinyl Chloride	10	10 UJ	10 U	10 U	10 U
Bromomethane	10	10 UJ	10 U	10 U	10 U
Chloroethane	10	10 UJ	10 U	10 U	10 U
Trichlorofluoromethane	10	10 UJ	10 U	10 U	10 U
1,1-Dichloroethene	10	10 UJ	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 UJ	10 U	10 U	10 U
Acetone	10	10 UJ	10 U	10 U	10 U
Carbon Disulfide	10	10 UJ	10 U	10 U	10 U
Methyl acetate	10	10 UJ	10 U	10 U	10 U
Methylene chloride	10	10 UJ	10 U	10 U	10 U
trans-1,2-dichloroethene	10	10 UJ	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 UJ	10 U	10 U	10 U
1,1-Dichloroethane	10	10 UJ	10 U	10 U	10 U
cis-1,2-dichloroethene	10	10 UJ	10 U	10 U	10 U
2-Butanone	10	10 UJ	10 U	10 U	10 U
Chloroform	10	10 UJ	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 UJ	10 U	10 U	10 U
Cyclohexane	10	10 UJ	10 U	10 U	10 U
Carbon Tetrachloride	10	10 UJ	10 U	10 U	10 U
Benzene	10	10 UJ	10 U	10 U	10 U
1,2-Dichloroethane	10	10 UJ	10 U	10 U	10 U
Trichloroethene	10	10 UJ	10 U	10 U	10 U
Methylcyclohexane	10	10 UJ	10 U	10 U	10 U
1,2-Dichloropropane	10	10 UJ	10 U	10 U	10 U
Bromodichloromethane	10	10 UJ	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 UJ	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 UJ	10 U	10 U	10 U
Toluene	10	10 UJ	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 UJ	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 UJ	10 U	10 U	10 U
Tetrachloroethene	10	10 UJ	10 U	10 U	10 U
2-Hexanone	10	10 UJ	10 U	10 U	10 U
Dibromochloromethane	10	10 UJ	10 U	10 U	10 U
1,2-Dibromoethane	10	10 UJ	10 U	10 U	10 U
Chlorobenzene	10	10 UJ	10 U	10 U	10 U
Ethylbenzene	10	10 UJ	10 U	10 U	10 U
Total Xylenes	10	10 UJ	10 U	10 U	10 U
Styrene	10	10 UJ	10 U	10 U	10 U
Bromoform	10	10 UJ	10 U	10 U	10 U
Isopropylbenzene	10	10 UJ	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 UJ	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 UJ	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 UJ	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 UJ	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 UJ	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 UJ	10 U	10 U	10 U

TRILLIUM INC.

ATTACHMENT B

ORGANIC ANALYSIS DATA SHEETS (Form I)
SDG Nos. RX1067 and RZ1067
Volatiles in Water - Marion Bragg, April 2003

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB
MB-1

Lab Name: COMPUCHEM   Contract: OLM04-REVS

Lab Code: LIBRTY   Case No.:   SAS No.:   SDG No.: RZ1067

Matrix: (soil/water) WATER   Lab Sample ID: RZ1067-3

Sample wt/vol: 5 (g/mL) ML   Lab File ID: RZ1067-3RB59

Level: (low/med) LOW   Date Received: 05/01/03

% Moisture: not dec. ________   Date Analyzed: 05/08/03

GC Column: ZB624   ID: 0.32 (mm)   Dilution Factor: 1.0

Soil Extract Volume:________(uL)   Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	~~U~~ UJ
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~2~~	~~J~~ U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	7	J
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

ccdt/nelson 7/23/03

FORM I VOA-1   OLM04.2

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MB-1 GW08PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-3

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-3RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	60	J
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 7/28/03

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW08PB
MB-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-3

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-3RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB
MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-4RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	~~U~~ UJ
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 2	~~U~~ U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	7	J
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	~~U~~ UJ
107-06-2	1,2-Dichloroethane	10	U

Erickson — 7/23/03

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-4RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	71	
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	~~U~~ UJ
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochlpromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	~~U~~ UJ
100-41-4	Ethylbenzene	10	~~U~~ UJ
1330-20-7	Xylene (Total)	10	~~U~~ UJ
100-42-5	Styrene	10	~~U~~ UJ
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	~~U~~ UJ
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	~~U~~ UJ
106-46-7	1,4-Dichlorobenzene	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	10	~~U~~ UJ
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	~~U~~ UJ

7/23/03 Wilkinson

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW08DPPB MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-4RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
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10.					
11.					
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13.					
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27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB MB-2

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-2RA59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	2	J
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U UJ
75-15-0	Carbon Disulfide	1	J
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 2	J U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

cas 5/8/03

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB MB-2

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-2RA59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	0.8	J
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW07PB
MB-2

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-2RA59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
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28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB FB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-1RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	23	J
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 2	J U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	11	J
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

daeu K 5/20/03

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB FB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-1RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW09FBPB
FB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-1RB59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	75-45-6	METHANE, CHLORODIFLUORO-	3.22	10	NJ
2.		UNKNOWN	5.59	25	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW10TBPB TB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-11A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 2	B U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U CAE
75-34-3	1,1-Dichloroethane	10	U 7/23/03
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

14 11

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW10TBPB
TB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-11A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F12

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW10TBPB TB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: RZ1067-11A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~15.38~~	~~6~~	~~J~~ R
2.					
3.					CAE 7/23/03
4.					
5.					
6.					
7.					
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30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB
SW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-1A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 Y	JB U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U CAE
75-34-3	1,1-Dichloroethane	10	U 7/23/03
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB
SW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-1A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

EPA SAMPLE NO.

SW01PB
SW-1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-1A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-2A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-2A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-2A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW04TBPB TB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-6A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 2	JBU
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U CAE 7/23/03
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW04TBPB TB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-6A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SW04TBPB TB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RX1067-6A59

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: not dec. _____ Date Analyzed: 05/08/03

GC Column: ZB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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30.					

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

ORGANIC ANALYSIS DATA
Semivolatiles in Water

SDG No. RX1067
April 2003 Sample Collections

Chemical Analyses Performed by:
CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 8, 2003

92241/CAE/PSN
\MARION\Apr03\BNA1

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the semivolatile organics analysis data prepared by CompuChem Environmental for five water samples from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RX1067, which was received for review on June 12, 2003. The following samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ).
- Results for di-n-butylphthalate in SW01PB and SW02PB, for butylbenzylphthalate in PW01PB, SW01PB, SW01DPPB, and SW02PB, and for bis(2-ethylhexyl)phthalate in SW01PB, SW01DPPB, and SW03PB were qualified as less than the contract required quantitation limit (CRQL) (U).
- The result for caprolactam in SW01DPPB was qualified as less than the reported value (10 U).
- The result for the tentatively identified compound (TIC) at RT 5.7 minutes in SW01PB was rejected (R).
- To maintain consistency with historical project data, sample-specific CRQLs for four of the samples were adjusted by the validator as listed in Section XI to reflect the effective concentration factors applicable because more than 1000 mL of each affected sample was extracted.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII.

This validation report should be considered part of the data package for all future distributions of the semivolatiles data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analyses OLM04.2. Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in conformance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev 12), "Evaluation of Organics Data for the CLP," (3/01) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified, and the results are therefore unusable.

These codes are recorded on the customized data table contained in Attachment A and the Organic Analysis Data Sheets (Form Is) in Attachment B of this validation report to indicate qualifications placed on the data as a result of the review.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

and SW02PB, for butylbenzylphthalate in PW-1PB, SW01PB, SW01DPPB, and SW02PB, and for bis(2-ethylhexyl)phthalate in SW01PB, SW01DPPB, and SW03PB were qualified as less than the contract required quantitation limit (CRQL) based on the associated MB contamination.

No tentatively identified compounds were detected in the MB.

V. Surrogate Recoveries

Recoveries of the eight surrogate compounds in all site samples, spiked samples, and blanks were within the acceptance limits documented on the summary forms.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample SW01PB was prepared and analyzed as an MS/MSD pair. Percent recoveries and relative percent differences (RPDs) between paired recoveries were correctly calculated, accurately reported, and within the acceptance limits documented on Form 3 except for the recoveries of nitrophenol (100% and 109%; QC 10-80%) and pentachlorophenol (133% and 133%; QC 9-103%). These high recoveries suggest the possibility of reporting false positives or detected results that are biased high. Since neither analyte was detected in the unspiked sample, no action was taken on this basis.

A comparison of results for non-blank-related, unspiked target analytes in SW01PB, the MS, and the MSD was made. Agreement among the three results for diethylphthalate (26.6 %RSD) was acceptable. Caprolactam was detected in the MSD (26 µg/L) but was not found in the original sample analysis or in the MS (10 U). Since caprolactam was not reported in the unspiked sample and has not previously been found at this sample location, no action was taken by the validator on this basis.

VII. Field Duplicates

Sample SW01DPPB was identified as a field duplicate of SW01PB. After qualifications based on associated blank contamination, caprolactam was reported in SW01DPPB (10 µg/L), but was not found in SW01PB (9 U). Based on professional judgment, the result for caprolactam in SW01DPPB was qualified as less than the reported value (10 U) due to this lack of confirmation in the field duplicate analyses.

No TICs were reported in SW01DPPB, but a TIC at 5.7 minutes was reported as an unknown at an estimated concentration of 3 µg/L in SW01PB. Visual inspection of the chromatogram for SW01DPPB did not reveal a peak present at the same RT as the TIC found in SW01PB. Due to lack

of confirmation in the field duplicate analyses, the results for the TIC at RT 5.7 minutes in SW01PB was rejected (R).

VII. Internal Standard (IS) Performance

All IS areas and RTs were within the acceptance limits (>50% and <200% of the area responses in the associated CC standard and within ±30 seconds, respectively) in all reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data package.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations were correctly calculated and accurately reported for all reported sample analyses, including adjustments for the extraction of slightly more than 1000 mL of all samples.

Adjustments were not made by the laboratory to the CRQLs to reflect the concentration factors applicable when more than 1000 mL of the sample was extracted. Although lowering the CRQLs under these circumstances is not required by the SOW and reporting the routine CRQLs is not technically incorrect, this adjustment has been made by the laboratory on previous data sets generated for this project. Therefore, to maintain consistency with historical project data, CRQLs for the following samples were adjusted by the validator to reflect extraction of slightly larger sample volumes than specified by the SOW:

Sample ID	Laboratory-Reported CRQLs	Volume Extracted/ Concentration Factor	Validator-Adjusted CRQLs
PW01PB	10/25 µg/L	1025 mL	10/24 µg/L
SW01DPPB	10/25 µg/L	1100 mL	9/23 µg/L
SW02PB	10/25 µg/L	1125 mL	9/22 µg/L
SW03PB	10/25 µg/L	1100 mL	9/23 µg/L

The data table in Attachment A lists all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific CRQLs may be found on the laboratory-generated Form I for each sample (Attachment B) and on the data table.

XI. Tentatively Identified Compounds (TIC)

One TIC was reported in each of three of the site samples in this data set, one of which was reported as an alkane. No TICs were found in the remaining samples. As previously discussed (Section VII), the TIC reported in SW01PB was rejected. No additional action by the validator was necessary with respect to the reported TIC results.

All reported TICs were appropriately qualified as "J" by the laboratory to emphasize that these are *estimated* concentrations. These "J" qualifiers were not removed by the validator.

The Form I-TIC for each sample, as reported by the laboratory and with qualifiers and corrections noted as described above, are included in Attachment B to this report.

XII. System Performance

The analytical system appears to have been working within method specifications at the time of these analyses, based on evaluation of the available raw data.

XII. Documentation

The samples reported in SDG No. RX1067 were recorded on a single chain of custody (COC) record which was included in the data package. The following issues were noted:

- Copies of courier airbills were not included in either data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on both of the COC records.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

XIV. Overall Assessment

Sample results were determined to be valid as reported with the following exceptions:

- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ) based on a very high %D value for this analyte in the associated CC standard.

- Results for di-n-butylphthalate in SW01PB and SW02PB, for butylbenzylphthalate in PW-1PB, SW01PB, SW01DPPB, and SW02PB, and for bis(2-ethylhexyl)phthalate in SW01PB, SW01DPPB, and SW03PB were qualified as less than the CRQL based on associated MB contamination.

- Based on professional judgment, the result for caprolactam in SW01DPPB was qualified as less than the reported value (10 U) due to lack of confirmation in the field duplicate analyses.

- Due to lack of confirmation in the field duplicate analyses, the TIC at RT 5.7 minutes in SW01PB was rejected (R).

- To maintain consistency with historical project data, sample-specific CRQLs for four of the samples were adjusted by the validator as listed in Section XI to reflect the effective concentration factors applicable because more than 1000 mL of each affected sample was extracted.

Documentation issues are discussed in Section XIII.

This validation report should be considered part of the data package for all future distributions of the semivolatiles data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLE
SDG No. RX1067
Semivolatiles in Water
Marion Bragg Landfill - April 2003

Marion Bragg Landfill - April 2003 Semivolatiles in Surface Waters

Results are in ug/L

Collection Point ==========>		PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID ==========>		PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No. ==========>		RX1067-5	RX1067-1	RX1067-2	RX1067-3	RX1067-4
Collection Date. ==========>		4/29/03	4/29/03	4/29/03	4/29/03	4/29/03
Concentration Factor ====>		0.98	1.00	0.91	0.89	0.91
	CRQL					
Benzaldehyde	10	10 U	10 U	9 U	9 U	9 U
Phenol	10	10 U	10 U	9 U	9 U	9 U
bis(2-Chloroethyl)ether	10	10 U	10 U	9 U	9 U	9 U
2-Chlorophenol	10	10 U	10 U	9 U	9 U	9 U
2-Methylphenol	10	10 U	10 U	9 U	9 U	9 U
2,2'-oxybis(1-Chloropropane)	10	10 U	10 U	9 U	9 U	9 U
Acetophenone	10	10 U	10 U	9 U	9 U	9 U
4-Methylphenol	10	10 U	10 U	9 U	9 U	9 U
N-Nitroso-di-n-propylamine	10	10 U	10 U	9 U	9 U	9 U
Hexachloroethane	10	10 U	10 U	9 U	9 U	9 U
Nitrobenzene	10	10 U	10 U	9 U	9 U	9 U
Isophorone	10	10 U	10 U	9 U	9 U	9 U
2-Nitrophenol	10	10 U	10 U	9 U	9 U	9 U
2,4-Dimethylphenol	10	10 U	10 U	9 U	9 U	9 U
bis(2-Chloroethoxy)methane	10	10 U	10 U	9 U	9 U	9 U
2,4-Dichlorophenol	10	10 U	10 U	9 U	9 U	9 U
Naphthalene	10	10 U	10 U	9 U	9 U	9 U
4-Chloroaniline	10	10 U	10 U	9 U	9 U	9 U
Hexachlorobutadiene	10	10 U	10 U	9 U	9 U	9 U
Caprolactam	10	10 U	10 U	10 U	18	9 U
4-Chloro-3-methylphenol	10	10 U	10 U	9 U	9 U	9 U
2-Methylnaphthalene	10	10 U	10 U	9 U	9 U	9 U
Hexachlorocyclopentadiene	10	10 UJ	10 UJ	9 UJ	9 UJ	9 UJ
2,4,6-Trichlorophenol	10	10 U	10 U	9 U	9 U	9 U
2,4,5-Trichlorophenol	25	24 U	25 U	23 U	22 U	23 U
1,1'-Biphenyl	10	10 U	10 U	9 U	9 U	9 U
2-Chloronaphthalene	10	10 U	10 U	9 U	9 U	9 U
2-Nitroaniline	25	24 U	25 U	23 U	22 U	23 U
Dimethylphthalate	10	10 U	10 U	9 U	9 U	9 U
2,6-Dinitrotoluene	10	10 U	10 U	9 U	9 U	9 U
Acenaphthylene	10	10 U	10 U	9 U	9 U	9 U
3-Nitroaniline	25	24 U	25 U	23 U	22 U	23 U
Acenaphthene	10	10 U	10 U	9 U	10 U	9 U
2,4-Dinitrophenol	25	24 U	25 U	23 U	22 U	23 U
4-Nitrophenol	25	24 U	25 U	23 U	22 U	23 U
Dibenzofuran	10	10 U	10 U	9 U	9 U	9 U
2,4-Dinitrotoluene	10	10 U	10 U	9 U	9 U	9 U
Diethylphthalate	10	10 U	10 U	9 U	0.4 J	9 U
Fluorene	10	10 U	10 U	9 U	9 U	9 U
4-Chlorophenyl-phenylether	10	10 U	10 U	9 U	9 U	9 U
4-Nitroaniline	25	24 U	25 U	23 U	22 U	23 U
4,6-Dinitro-2-methylphenol	25	24 U	25 U	23 U	22 U	23 U
N-nitrosodiphenylamine	10	10 U	10 U	9 U	9 U	9 U
4-Bromophenyl-phenylether	10	10 U	10 U	9 U	9 U	9 U
Hexachlorobenzene	10	10 U	10 U	9 U	9 U	9 U
Atrazine	10	10 U	10 U	9 U	9 U	9 U
Pentachlorophenol	25	24 U	25 U	23 U	22 U	23 U
Phenanthrene	10	10 U	10 U	9 U	9 U	9 U
Anthracene	10	10 U	10 U	9 U	9 U	9 U
Carbazole	10	10 U	10 U	9 U	9 U	9 U
Di-n-butylphthalate	10	10 U	10 U	9 U	9 U	9 U
Fluoranthene	10	10 U	10 U	9 U	9 U	9 U
Pyrene	10	10 U	10 U	9 U	9 U	9 U
Butylbenzylphthalate	10	10 U	10 U	9 U	9 U	9 U
3,3'-Dichlorobenzidine	10	10 U	10 U	9 U	9 U	9 U
Benzo(a)anthracene	10	10 U	10 U	9 U	9 U	9 U
Chrysene	10	10 U	10 U	9 U	9 U	9 U
bis(2-Ethylhexyl)phthalate	10	10 U	10 U	9 U	9 U	9 U
Di-n-octylphthalate	10	10 U	10 U	9 U	9 U	9 U
Benzo(b)fluoranthene	10	10 U	10 U	9 U	9 U	9 U
Benzo(k)fluoranthene	10	10 U	10 U	9 U	9 U	9 U
Benzo(a)pyrene	10	10 U	10 U	9 U	9 U	9 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U	9 U	9 U	9 U
Dibenzo(a,h)anthracene	10	10 U	10 U	9 U	9 U	9 U
Benzo(g,h,i)perylene	10	10 U	10 U	9 U	9 U	9 U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW01PB

PW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-5

Sample wt/vol: 1025 (g/mL) ML Lab File ID: RX1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	Ø UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	24 ~~25~~	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	24 ~~25~~	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	24 ~~25~~	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW01PB
PW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-5

Sample wt/vol: 1025 (g/mL) ML Lab File ID: RX1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	24 ~~25~~	U
100-02-7	4-Nitrophenol	24 ~~25~~	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	24 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	24 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	24 ~~25~~	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10 ~~0.2~~	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CAErickson 7/8/03

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PW01PB
PW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-5

Sample wt/vol: 1025 (g/mL) ML Lab File ID: RX1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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28.					
29.					
30.					

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PW01PB
PW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-5

Sample wt/vol: 1025 (g/mL) ML Lab File ID: RX1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
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30.					

ALKANE NARRATIVE REPORT
Report date : 05/14/2003
SDG: RX1067

PW-1

Client Sample ID: PW01PB Lab Sample ID: RX1067-5 File ID: RX1067-5A70

Compound	RT	Est. Conc.	Q
Unknown Alkane	6.75	3	J

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB
SW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RX1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	UUJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U CAE 7/8/03
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB
SW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RX1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10 ~~0.5~~	~~J~~ U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10 ~~0.5~~	~~JB~~ U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10 ~~0.3~~	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~0.6~~	~~JB~~ U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CAErikson 7/8/03

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW01PB
SW-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RX1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~5.69~~	~~3~~	~~J~~ R
2.					
3.				CAE	7/8/03
4.					
5.					
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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-2

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RX1067-2A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U CAE 7/8/03
87-68-3	Hexachlorobutadiene	~~10~~	U ~~U~~ UJ
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	~~U~~ UJ
88-06-2	2,4,6-Trichlorophenol	9 ~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	9 ~~10~~	U
208-96-8	Acenaphthylene	9 ~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-2

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RX1067-2A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~23~~ ~~25~~	U
100-02-7	4-Nitrophenol	~~23~~ ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	9 ~~10~~	U
100-01-6	4-Nitroaniline	~~23~~ ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	~~23~~ ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	9 ~~10~~	U
87-86-5	Pentachlorophenol	~~23~~ ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	9 ~~0.2~~	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	9 ~~0.5~~	~~JB~~ U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	9 ~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAErikson 7/8/03

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-2

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RX1067-2A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW02PB
SW-5

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-3

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RX1067-3A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	9 ~~10~~	U
105-60-2	Caprolactam	18	
59-50-7	4-Chloro-3-methylphenol	9 ~~10~~	U
91-57-6	2-Methylnaphthalene	9 ~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U UJ
88-06-2	2,4,6-Trichlorophenol	9 ~~10~~	U
95-95-4	2,4,5-Trichlorophenol	22 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	22 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	9 ~~10~~	U
208-96-8	Acenaphthylene	9 ~~10~~	U
99-09-2	3-Nitroaniline	22 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CQ Erikson
7/8/03

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW02PB
SW-5

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-3

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RX1067-3A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~22~~ ~~25~~	U
100-02-7	4-Nitrophenol	~~22~~ ~~25~~	U
132-64-9	Dibenzofuran	~~9~~ ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~9~~ ~~10~~	U
84-66-2	Diethylphthalate	0.4	J
86-73-7	Fluorene	~~9~~ ~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~9~~ ~~10~~	U
100-01-6	4-Nitroaniline	~~22~~ ~~23~~ ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	~~22~~ ~~23~~ ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	~~9~~ ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~9~~ ~~10~~	U
87-86-5	Pentachlorophenol	~~22~~ ~~25~~	U
85-01-8	Phenanthrene	~~9~~ ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~9~~ ~~0.4~~	~~JB~~ U
206-44-0	Fluoranthene	~~9~~ ~~10~~	U
129-00-0	Pyrene	~~9~~ ~~10~~	U
85-68-7	Butylbenzylphthalate	~~9~~ ~~0.4~~	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CA Erikson 7/8/03

1G

EPA SAMPLE NO.

SW02PB
SW-5

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-3

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RX1067-3A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
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28.					
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30.					

1C

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SW03PB
SW-6

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-4

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RX1067-4A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U UJ
88-06-2	2,4,6-Trichlorophenol	9 ~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	9 ~~10~~	U
208-96-8	Acenaphthylene	9 ~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW03PB
SW-6

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-4

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RX1067-4A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	9 ~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	9 ~~0.8~~	~~JB~~ U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CA Erikson 7/8/03

1G

EPA SAMPLE NO.

SW03PB
SW-6

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix: (soil/water) WATER Lab Sample ID: RX1067-4

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RX1067-4A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/08/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	6.75	3	J
2.					
3.					
4.					
5.					
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TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

ORGANIC ANALYSIS DATA
Semivolatiles in Water

SDG No. RZ1067
April 2003 Sample Collections

Chemical Analyses Performed by:
CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 21, 2003

92241/CAE/DAS
\MARION\Apr03\BNA2

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the semivolatile organics analysis data prepared by CompuChem Environmental for nine water samples and one field blank (FB) from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RZ1067, which was received for review on July 8, 2003. The following samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for 2,4-dinitrophenol in GW03PB, GW04PB, GW05PB, and GW06PB were rejected (R).
- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ).
- Results for 2,4-dinitrophenol in GW09FBPB, GW07PB, GW08PB, GW08DPPB, GW01PB, and GW02PB were qualified as estimated (UJ).
- Results for di-n-butylphthalate in GW07PB, GW03PB, GW02PB, and GW09FBPB, for butylbenzylphthalate in GW07PB, GW02PB, and GW09FBPB, and for bis(2-ethylhexyl)phthalate in GW08DPPB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit (CRQL).
- Results for caprolactam in GW03PB and GW05PB and for diethylphthalate in GW07PB, GW04PB, and GW02PB were qualified as less than the sample-specific CRQL (U).
- The result for the TIC at RT 6.77 minutes in GW08DPPB was rejected (R).
- Sample-specific CRQLs for GW02PB and GW07PB were adjusted by the validator as listed in Section X to reflect the effective concentration factors applicable because more than 1000 mL of each sample was extracted.
- The TIC reported at RT 4.94 in GW05PB was rejected (R).

- The TIC at RT 22.76 minutes in GW01PB was moved from Form I-TIC to the alkane narrative report.

- The tentative identification of the TIC peak at RT 9.09 minutes in GW06PB was changed to "unknown" (from ninhydrin), and the "N" qualifier applied by the laboratory was removed.

- The complete compound name for the TIC peak at 15.36 minutes in GW07PB was added to the Form I-TIC.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XIII.

This validation report should be considered part of the data package for all future distributions of the semivolatiles data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analyses OLM04.2. Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in conformance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev 12), "Evaluation of Organics Data for the CLP," (3/01) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified, and the results are therefore unusable.

These codes are recorded on the customized data table contained in Attachment A and the Organic Analysis Data Sheets (Form Is) in Attachment B of this validation report to indicate qualifications placed on the data as a result of the review.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The samples were collected on 4/30/03. All samples were extracted on 5/5/03, which is within the established (seven days from collection) holding time. Analyses were performed on 5/9/03 and 5/12/03, well within the required holding time of 40 days from extraction. Therefore, both required holding times were met.

Acceptable (4°C ±2°C) cooler temperatures (2-6°C) on receipt at the laboratory were recorded on the COC record applicable to these samples. The same temperatures were also recorded on the applicable laboratory receiving logs.

Sampler notations on the COCs indicate that the samples for semivolatiles analysis were iced. The narrative in the data package further states that all samples were received intact and properly refrigerated.

II. GC/MS Instrument Performance Checks

Four decafluorotriphenylphosphine (DFTPP) instrument performance checks were run, representing every shift (12-hour period) during which samples or associated standards were analyzed. Results for all four instrument performance checks were acceptable.

III. Calibration

Analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as 5972HP70 (HP70). One or more target analytes required manual integration in all of the standards and many of the samples associated with this data set. Documentation of each integration performed by the laboratory was provided in the data package; all manual integrations were correctly performed and accurately transcribed to the applicable quantitation report.

Internal standard compound acenaphthene-d_{10} was manually integrated in two initial calibration standards and surrogate compound phenol-d_5 was manually integrated in one initial calibration standard. These integrations were also fully documented and verified to be acceptable.

A. Initial Calibration (IC)

One IC (4/27/03) was performed in support of the reported sample analyses. Documentation of all individual IC standards analyzed was present in the data package and average relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported. All average RRFs were above the minimum response criterion (0.05). All %RSDs were below the maximum acceptance criterion of 30% with the exception of 2,4-dinitrophenol (44.5%).

2,4-Dinitrophenol was not detected in any of the samples in this data set, and the %RSD did not significantly exceed the acceptance criterion (i.e., was not greater than 50%). Therefore, based on professional judgment, no action was taken as a result of the high %RSD value for this analyte.

B. Continuing Calibration (CC)

Sample and associated quality control analyses were performed under three CC standards. Documentation of all three CC standards was present in the data package, and RRF as well as percent difference (%D) values were correctly calculated and accurately reported in all cases.

All RRFs were above the 0.05 minimum criterion in the three CC standards with the exception of 2,4-dinitrophenol (0.036) in the 5/12/03 CC. Results for 2,4-dinitrophenol in GW03PB, GW04PB, GW05PB, and GW06PB were rejected (R) as unreliable on this basis.

The following %D values were above the maximum acceptance criterion (25%):

5/8/03-10:30:
hexachlorocyclopentadiene - 56.6%
2,4-dinitrophenol - 42.9%
pentachlorophenol - 26.0%
2,4,6-tribromophenol (surrogate) - 30.1%

5/9/03-09:59:
hexachlorobutadiene - 36.4%
hexachlorocyclopentadiene - 76.9%
2,4-dinitrophenol - 59.1%
4,6-dinitro-2-methylphenol - 27.9%
pentachlorophenol - 30.3%

5/12/03-08:55:
hexachlorocyclopentadiene - 60.2%
2,4-dinitrophenol - 76.6%
4-nitrophenol - 30.2%
4-nitroaniline - 34.1%
pentachlorophenol - 26.8%
indeno(1,2,3-cd)pyrene - 28.2%
dibenzo(a,h)anthracene - 25.8%
2,4,6-tribromophenol (surrogate) - 27.6%

Only the method blank was associated with the 5/8/03 CC standard. Therefore, no sample results required qualification based on the high %D values listed above for this standard.

All of the sample analyses were associated with the 5/9/03 and 5/12/03 CC standards. No positive results were reported for the affected target analytes in any of the samples. With the exception of 2,4-dinitrophenol in the 5/12/03 CC, the RRFs were all acceptable (i.e., were greater

than 0.05). For hexachlorobutadiene, 4,6-dinitro-2-methylphenol, and pentachlorophenol in the 5/9/03 CC and for 4-nitrophenol, 4-nitroaniline, pentachlorophenol, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and 2,4,6-tribromophenol (surrogate) in the 5/12/03 CC, the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). Results for hexachlorocyclopentadiene and 2,4-dinitrophenol in all site samples were qualified as estimated (UJ) based on the very high %D values (i.e., greater than 50%) for these analytes in the associated CC standards. No further action was warranted based on these CC standard results.

IV. Blanks

One laboratory method blank (MB: SBLKHC) was prepared and analyzed with the samples in this data set. Di-n-butylphthalate (0.3 µg/L), butylbenzylphthalate (0.3 µg/L), and bis(2-ethylhexyl)phthalate (0.8 µg/L) were reported in this MB. Results for di-n-butylphthalate in GW07PB, GW03PB, GW02PB, and GW09FBPB, for butylbenzylphthalate in GW07PB, GW02PB, and GW09FBPB, and for bis(2-ethylhexyl)phthalate in GW08DPPB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit (CRQL) based on the associated MB contamination.

No tentatively identified compounds were detected in the MB.

One field blank (GW09FBPB) was associated with this data set. After qualifications based on laboratory blank contamination, caprolactam (15 µg/L) and diethylphthalate (0.3 µg/L) were reported in GW09FBPB. Results for caprolactam in GW03PB and GW05PB and for diethylphthalate in GW07PB, GW04PB, and GW02PB were qualified as less than the sample-specific CRQL (U) based on the associated field blank contamination.

One tentatively identified compound was detected in the field blank; see Section XI for further discussion.

V. Surrogate Recoveries

Recoveries of the eight surrogate compounds in all site samples, spiked samples, and blanks were within the acceptance limits documented on the summary form with the exception of 2-chlorophenol (120%; QC 33-110%) in the matrix spike analysis of GW08PB. Since only one surrogate recovery was outside acceptance limits, and all surrogate recoveries were acceptable in the unspiked and matrix spike duplicate analysis of this sample, no action was warranted on this basis.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample GW08PB was prepared and analyzed as an MS/MSD pair. Percent recoveries and relative percent differences (RPDs) between paired recoveries were correctly calculated, accurately reported, and within the acceptance limits documented on Form 3 except for the recoveries of phenol (129%; QC 10-80%) and 2,4-dinitrotoluene (104%; QC 24-96%) in the MS and for 4-nitrophenol (129% and 103%; QC 10-80%) and pentachlorophenol (147% and 131%; QC 9-103%) in both spiked analyses. These high recoveries suggest the possibility of reporting false positives or detected results that are biased high. Since none of the affected analytes was detected in the unspiked sample, no action was taken on this basis.

No non-blank-related, unspiked target analytes were detected in GW08PB, the MS, or the MSD. Therefore, no further evaluation of precision could be made using these data.

VII. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. After qualifications based on associated blank contamination, no target analytes were reported in either sample. Therefore, no quantitative evaluation of precision could be made using these data.

No TICs were reported in GW08PB, but a TIC at 6.77 minutes was reported as an unknown in GW08DPPB. No peak area was found on the TIC summary page included in the data package, and an estimated concentration of "0 µg/L" was reported by the laboratory. Visual inspection of the chromatogram for GW08PB did not reveal a peak present at or near RT 6.77 minutes. Due to the lack of available quantitative data as well as lack of confirmation in the field duplicate analyses, the result for the TIC at RT 6.77 minutes in GW08DPPB was rejected (R).

VIII. Internal Standard (IS) Performance

All IS areas and RTs were within the acceptance limits (>50% and <200% of the area responses in the associated CC standard and within ±30 seconds, respectively) in all reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the data package.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations were correctly calculated and accurately reported for all reported sample analyses, including adjustments for the extraction of slightly more or less than 1000 mL of all samples.

Adjustments were made by the laboratory to the CRQLs to reflect the dilution factors applicable when less than 1000 mL of sample was extracted, but were not made to reflect the concentration factors applicable when more than 1000 mL of the sample was extracted. Although lowering the CRQLs under these circumstances is not required by the SOW and reporting the routine CRQLs is not technically incorrect, this adjustment has been made by the laboratory on previous data sets generated for this project. Therefore, to maintain consistency with historical project data, CRQLs for the following samples were adjusted by the validator to reflect extraction of slightly larger sample volumes than specified by the SOW:

Sample ID	Laboratory-Reported CRQLs	Volume Extracted/ Concentration Factor	Validator-Adjusted CRQLs
GW02PB	10/25 µg/L	1050 mL/0.95	10/24 µg/L
GW07PB	10/25 µg/L	1050 mL/0.95	10/24 µg/L

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific CRQLs may be found on the laboratory-generated Form I for each sample (Attachment B) as well as on the data tables.

XI. Tentatively Identified Compounds (TIC)

One to 30 TICs were reported in all but one of the site samples in this data set, several of which were reported as alkanes. No TICs were found in GW08PB. As previously discussed (Section VII), the TIC reported in GW08DPPB was rejected.

One TIC, at RT 4.94 minutes, was reported in the field blank (GW09FBPB). A comparable peak was also reported as a TIC in GW05PB. Based on the presence of this peak in the associated field blank, the TIC reported at RT 4.94 in GW05PB was rejected (R).

The following additional actions were taken by the validator with respect to the remaining reported TIC results:

- Based on the mass spectrum, the TIC at RT 22.76 minutes in GW01PB was moved from Form I-TIC to the alkane narrative report. A copy of the library search for this peak is included in Attachment C.

- Based on professional judgment, the tentative identification of the TIC peak at RT 9.09 minutes in GW06PB was changed to "unknown" (from ninhydrin), and the "N" qualifier applied by the laboratory was removed by the validator. A copy of the library search for this peak is included in Attachment C.

- The complete compound name for the TIC peak at 15.36 minutes in GW07PB was added to the Form I-TIC by the validator.

All reported TICs were appropriately qualified as "J" by the laboratory to emphasize that these are *estimated* concentrations. These "J" qualifiers were not removed by the validator. Where a specific compound was tentatively identified, the TIC was also flagged "N" by the laboratory. Except where noted above, these "N" qualifiers were also not removed by the validator.

The Form I-TIC for each sample, as reported by the laboratory and with qualifiers and corrections noted as described above, are included in Attachment B to this report.

XII. System Performance

The analytical system appears to have been working within method specifications at the time of these analyses, based on evaluation of the available raw data.

XIII. Documentation

The samples reported in SDG No. RZ1067 were recorded on three chain of custody (COC) records which were included in the data package. The following issues were noted:

- Copies of courier airbills were not included in the data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on the COC records.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

XIV. Overall Assessment

Sample results were determined to be valid as reported with the following exceptions:

- Results for 2,4-dinitrophenol in GW03PB, GW04PB, GW05PB, and GW06PB were rejected (R) based on an unacceptably low relative response factor in the associated continuing calibration standard. These results also warranted qualification as estimated based on an elevated percent difference value in the continuing calibration standard; the "R" qualifier takes precedence.

- Results for hexachlorocyclopentadiene in all samples were qualified as estimated (UJ) based on a very high %D value for this analyte in the associated CC standards.

- Results for 2,4-dinitrophenol in GW09FBPB, GW07PB, GW08PB, GW08DPPB, GW01PB, and GW02PB were qualified as estimated (UJ) based on a very high %D value for this analyte in the associated CC standard.

- Results for di-n-butylphthalate in GW07PB, GW03PB, GW02PB, and GW09FBPB, for butylbenzylphthalate in GW07PB, GW02PB, and GW09FBPB, and for bis(2-ethylhexyl)phthalate in GW08DPPB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and GW01PB were qualified as less than the sample-specific CRQL based on associated method blank contamination.

- Results for caprolactam in GW03PB and GW05PB and for diethylphthalate in GW07PB, GW04PB, and GW02PB were qualified as less than the sample-specific CRQL (U) based on associated field blank contamination.

- Due to the lack of available quantitative data as well as lack of confirmation in the field duplicate analyses, the result for the TIC at RT 6.77 minutes in GW08DPPB was rejected (R).

- To maintain consistency with historical project data, sample-specific CRQLs for GW02PB and GW07PB were adjusted by the validator as listed in Section X to reflect the effective concentration factors applicable because more than 1000 mL of each sample was extracted.

- Based on the presence of this peak in the associated field blank, the TIC reported at RT 4.94 in GW05PB was rejected (R).

- Based on the mass spectrum, the TIC at RT 22.76 minutes in GW01PB was moved from Form I-TIC to the alkane narrative report.

- Based on professional judgment, the tentative identification of the TIC peak at RT 9.09 minutes in GW06PB was changed to "unknown" (from ninhydrin), and the "N" qualifier applied by the laboratory was removed by the validator.

- The complete compound name for the TIC peak at 15.36 minutes in GW07PB was added to the Form I-TIC.

Documentation issues are discussed in Section XIII.

This validation report should be considered part of the data package for all future distributions of the semivolatiles data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
SDG No. RZ1067
Semivolatiles in Water
Marion Bragg Landfill - April 2003

Results are in ug/L

Collection Point ==========>		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID ==========>		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ==========>		RZ1067-3	RZ1067-4	RZ1067-2	RZ1067-7	RZ1067-8	RZ1067-9	RZ1067-10	RZ1067-6
Collection Date. ==========>		4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
Dilution/Concentration Factor ====>		1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95
	CRQL								
Benzaldehyde	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
2,4,6-Trichlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
1,1'-Biphenyl	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
Dimethylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
Acenaphthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25	25 UJ	25 UJ	24 UJ	R	R	R	R	24 UJ
4-Nitrophenol	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
Dibenzofuran	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
4,6-Dinitro-2-methylphenol	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
N-nitrosodiphenylamine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Atrazine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25	25 U	25 U	24 U	25 U	25 U	25 U	25 U	24 U
Phenanthrene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Results are in ug/L

Collection Point ==========>		MB-10	Field Blank
Sample ID ==========>		GW01PB	GW09FBPB
Lab Sample No. ==========>		RZ1067-5	RZ1067-1
Collection Date. ==========>		4/30/03	4/30/03
Dilution/Concentration Factor ====>		1.08	1.08
	CRQL		
Benzaldehyde	10	11 U	11 U
Phenol	10	11 U	11 U
bis(2-Chloroethyl)ether	10	11 U	11 U
2-Chlorophenol	10	11 U	11 U
2-Methylphenol	10	11 U	11 U
2,2'-oxybis(1-Chloropropane)	10	11 U	11 U
Acetophenone	10	0.6 J	11 U
4-Methylphenol	10	11 U	11 U
N-Nitroso-di-n-propylamine	10	11 U	11 U
Hexachloroethane	10	11 U	11 U
Nitrobenzene	10	11 U	11 U
Isophorone	10	11 U	11 U
2-Nitrophenol	10	11 U	11 U
2,4-Dimethylphenol	10	11 U	11 U
bis(2-Chloroethoxy)methane	10	11 U	11 U
2,4-Dichlorophenol	10	11 U	11 U
Naphthalene	10	2 J	11 U
4-Chloroaniline	10	11 U	11 U
Hexachlorobutadiene	10	11 U	11 U
Caprolactam	10	11 U	15
4-Chloro-3-methylphenol	10	11 U	11 U
2-Methylnaphthalene	10	11 U	11 U
Hexachlorocyclopentadiene	10	11 UJ	11 UJ
2,4,6-Trichlorophenol	10	11 U	11 U
2,4,5-Trichlorophenol	25	27 U	27 U
1,1'-Biphenyl	10	0.4 J	11 U
2-Chloronaphthalene	10	11 U	11 U
2-Nitroaniline	25	27 U	27 U
Dimethylphthalate	10	11 U	11 U
2,6-Dinitrotoluene	10	11 U	11 U
Acenaphthylene	10	11 U	11 U
3-Nitroaniline	25	27 U	27 U
Acenaphthene	10	11 U	11 U
2,4-Dinitrophenol	25	11 UJ	27 UJ
4-Nitrophenol	25	11 U	27 U
Dibenzofuran	10	11 U	11 U
2,4-Dinitrotoluene	10	11 U	11 U
Diethylphthalate	10	11 U	0.3 J
Fluorene	10	11 U	11 U
4-Chlorophenyl-phenylether	10	11 U	11 U
4-Nitroaniline	25	27 U	27 U
4,6-Dinitro-2-methylphenol	25	27 U	27 U
N-nitrosodiphenylamine	10	11 U	11 U
4-Bromophenyl-phenylether	10	11 U	11 U
Hexachlorobenzene	10	11 U	11 U
Atrazine	10	11 U	11 U
Pentachlorophenol	25	27 U	27 U
Phenanthrene	10	0.3 J	11 U
Anthracene	10	11 U	11 U
Carbazole	10	11 U	11 U
Di-n-butylphthalate	10	11 U	11 U
Fluoranthene	10	11 U	11 U
Pyrene	10	11 U	11 U
Butylbenzylphthalate	10	11 U	11 U
3,3'-Dichlorobenzidine	10	11 U	11 U
Benzo(a)anthracene	10	11 U	11 U
Chrysene	10	11 U	11 U
bis(2-Ethylhexyl)phthalate	10	11 U	11 U
Di-n-octylphthalate	10	11 U	11 U
Benzo(b)fluoranthene	10	11 U	11 U
Benzo(k)fluoranthene	10	11 U	11 U
Benzo(a)pyrene	10	11 U	11 U
Indeno(1,2,3-cd)pyrene	10	11 U	11 U
Dibenzo(a,h)anthracene	10	11 U	11 U
Benzo(g,h,i)perylene	10	11 U	11 U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB MB-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-3A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

CAE 4/21/03

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB MB-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-3A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U UJ
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CAE 5/11/03

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW08PB MB-1

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-3A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
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10.					
11.					
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13.					
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24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB
MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-4A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U U.T
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U CDE 5/10/03
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-4A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U UJ
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 J	JB U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW08DPPB
MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-4A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~6.77~~	~~0~~	R
2.				CAS WKSOA	7/21/03
3.					
4.					
5.					
6.					
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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB
MB-2

Lab Name: COMPUCHEM   Contract: OLM04-REVS

Lab Code: LIBRTY   Case No.:   SAS No.:   SDG No.: RZ1067

Matrix: (soil/water) WATER   Lab Sample ID: RZ1067-2

Sample wt/vol: 1050 (g/mL) ML   Lab File ID: RZ1067-2A70

Level: (low/med) LOW   Date Received: 05/01/03

% Moisture: ______ decanted: (Y/N)___   Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL)   Date Analyzed: 05/09/03

Injection Volume: 2.0(uL)   Dilution Factor: 1.0

GPC Cleanup: (Y/N) N   pH: 7.0   Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	~~U~~ UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	24 ~~25~~	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	24 ~~25~~	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	24 ~~25~~	U
83-32-9	Acenaphthene	10	U

FORM I SV-1   OLM04.2

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB
MB-2

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-2

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RZ1067-2A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~24~~ 25	~~U~~ UJ
100-02-7	4-Nitrophenol	~~24~~ 25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10 ~~0.5~~	~~J~~ U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	~~24~~ 25	U
534-52-1	4,6-Dinitro-2-methylphenol	~~24~~ 25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	~~24~~ 25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10 ~~0.7~~	~~JB~~ U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10 ~~0.5~~	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

7/21/03 JMS

1G

EPA SAMPLE NO.

GW07PB
MB-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-2

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RZ1067-2A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 8 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.68	2	J
2.		UNKNOWN	6.74	2	J
3.	~~585-34-2~~	PHENOL, M-TERT-BUTYL- (ISOMER)	8.82	4	NJ
4.		UNKNOWN	9.39	2	J
5.		UNKNOWN	14.91	8	J
6.	115-28-6	BICYCLO[2.2.1]HEPT-5-ENE-2,3-*	15.36	87	NJ
7.	10544-50-0	SULFUR, MOL. (S8)	15.87	29	NJ
8.		UNKNOWN	16.40	8	J
9.					
10.					
11.					
12.					
13.					
14.					
15.		* dicarboxylic acid, 1,4,5,6,7,7-hexachlor-			
16.					
17.					
18.		CAErikson 7/21/03			
19.					
20.					
21.					
22.					
23.					
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27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW03PB MB-5

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-7

Sample wt/vol: 500 (g/mL) ML Lab File ID: RZ1067-7A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10 2	J UJ
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

5/19/03 DMB

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW03PB MB-5

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-7

Sample wt/vol: 500 (g/mL) ML Lab File ID: RZ1067-7A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	R ~~25~~	~~U~~
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10 ~~0.3~~	~~JB~~ U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~1~~	~~JB~~ U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1G

EPA SAMPLE NO.

GW03PB MB-6

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-7

Sample wt/vol: 500 (g/mL) ML Lab File ID: RZ1067-7A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	6.75	5	J
2.		UNKNOWN	14.91	5	J
3.		UNKNOWN	15.36	28	J
4.	10544-50-0	SULFUR, MOL. (S8)	15.88	42	NJ
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
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29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW04PB
MB-6

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-8A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	Ø UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U cae 7/21/03
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

GW04PB
MB-6

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-8A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~R 25~~	~~U~~
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	~~10~~ 0.2	~~U~~ J U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~ 0.8	~~U~~ JB U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

Sample Extract

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW04PB
MB-6

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-8A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 9 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.98	4	J
2.		UNKNOWN	7.51	12	J
3.		UNKNOWN	9.39	3	J
4.		UNKNOWN	9.63	4	J
5.		UNKNOWN	11.79	2	J
6.	934-34-9	2(3H)-BENZOTHIAZOLONE	12.22	8	NJ
7.		UNKNOWN	16.41	17	J
8.		UNKNOWN	16.71	3	J
9.		UNKNOWN	17.91	7	J
10.					
11.					
12.					
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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW05PB
MB-7

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-9A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10 J	J U 7/21/03
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U UJ CCE 7/21/03
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW05PB
MB-7

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-9A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	R ~~25~~	~~U~~
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~4~~	JB U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW05PB
MB-7

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-9A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N) ___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	~~4.94~~	~~2~~	~~J~~ R
2.		UNKNOWN	19.62	2	J
3.				CGatkson 5/21/03	
4.					
5.					
6.					
7.					
8.					
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30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW06PB MB-8

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-10A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U CAB 5/21/03
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW06PB MB-8

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-10A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	R ~~25~~	~~U~~
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 0.8	JB U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CAK 5/21/03

CAK 5/21/03

1G

EPA SAMPLE NO.

GW06PB MB-8

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: RZ1067-10A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/12/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 30 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.86	22	J
2.	UNKNOWN	5.12	5	J
3.	UNKNOWN	6.39	8	J
4.	UNKNOWN	8.69	8	J
5. ~~485-47-2~~	~~NINHYDRIN~~ UNKNOWN	9.09	12	NJ
6.	UNKNOWN	9.32	7	J
7.	UNKNOWN CAGuidson 7/21/03	9.80	5	J
8.	UNKNOWN	10.29	5	J
9.	UNKNOWN	11.73	5	J
10.	UNKNOWN	14.64	6	J
11.	UNKNOWN	14.69	5	J
12.	UNKNOWN	14.93	11	J
13.	UNKNOWN	15.40	15	J
14.	UNKNOWN	15.46	5	J
15.	UNKNOWN	15.48	6	J
16.	UNKNOWN	15.55	6	J
17.	UNKNOWN	16.42	16	J
18.	UNKNOWN	16.54	6	J
19.	UNKNOWN	16.66	7	J
20.	UNKNOWN	18.11	7	J
21.	UNKNOWN	18.15	8	J
22.	UNKNOWN	18.20	10	J
23.	UNKNOWN	18.88	6	J
24.	UNKNOWN	18.95	9	J
25.	UNKNOWN	19.04	7	J
26.	UNKNOWN	19.38	15	J
27.	UNKNOWN	19.45	11	J
28.	UNKNOWN	19.51	8	J
29.	UNKNOWN	20.23	10	J
30.	UNKNOWN	20.32	6	J

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW02PB
MB-9

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-6

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RZ1067-6A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	24 ~~25~~	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	24 ~~25~~	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	24 ~~25~~	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW02PB MB-9

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-6

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RZ1067-6A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND		
51-28-5	2,4-Dinitrophenol	~~24~~ ~~25~~	~~U~~ UJ
100-02-7	4-Nitrophenol	~~24~~ ~~25~~	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10 ~~0.3~~	~~J~~ U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	~~24~~ ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	~~24~~ ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	~~24~~ ~~25~~	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10 ~~0.5~~	~~JB~~ U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10 ~~0.4~~	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~6~~	~~JB~~ U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1G

EPA SAMPLE NO.

GW02PB MB-9

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-6

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RZ1067-6A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

Number TICs found: 5 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.39	18	J
2.		UNKNOWN	5.69	2	J
3.		UNKNOWN	6.76	3	J
4.		UNKNOWN	8.84	2	J
5.	10544-50-0	SULFUR, MOL. (S8)	15.86	3	NJ
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
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23.					
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26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW01PB
MB-10

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-5

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	11	U
108-95-2	Phenol	11	U
111-44-4	bis(2-Chloroethyl)ether	11	U
95-57-8	2-Chlorophenol	11	U
95-48-7	2-Methylphenol	11	U
108-60-1	2,2'-oxybis(1-Chloropropane)	11	U
98-86-2	Acetophenone	0.6	J
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-di-n-propylamine	11	U
67-72-1	Hexachloroethane	11	U
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	U
88-75-5	2-Nitrophenol	11	U
105-67-9	2,4-Dimethylphenol	11	U
111-91-1	bis(2-Chloroethoxy)methane	11	U
120-83-2	2,4-Dichlorophenol	11	U
91-20-3	Naphthalene	2	J
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	U
105-60-2	Caprolactam	11	U
59-50-7	4-Chloro-3-methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	UJ
88-06-2	2,4,6-Trichlorophenol	11	U
95-95-4	2,4,5-Trichlorophenol	27	U
92-52-4	1,1'-Biphenyl	0.4	J
91-58-7	2-Chloronaphthalene	11	U
88-74-4	2-Nitroaniline	27	U
131-11-3	Dimethylphthalate	11	U
606-20-2	2,6-Dinitrotoluene	11	U
208-96-8	Acenaphthylene	11	U
99-09-2	3-Nitroaniline	27	U
83-32-9	Acenaphthene	11	U

CLP 5/12/03

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW01PB MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-5

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	27	~~U~~ UJ
100-02-7	4-Nitrophenol	27	U
132-64-9	Dibenzofuran	11	U
121-14-2	2,4-Dinitrotoluene	11	U
84-66-2	Diethylphthalate	11	U
86-73-7	Fluorene	11	U
7005-72-3	4-Chlorophenyl-phenylether	11	U
100-01-6	4-Nitroaniline	27	U
534-52-1	4,6-Dinitro-2-methylphenol	27	U
86-30-6	N-nitrosodiphenylamine (1)	11	U
101-55-3	4-Bromophenyl-phenylether	11	U
118-74-1	Hexachlorobenzene	11	U
1912-24-9	Atrazine	11	U
87-86-5	Pentachlorophenol	27	U
85-01-8	Phenanthrene	0.3	J
120-12-7	Anthracene	11	U
86-74-8	Carbazole	11	U
84-74-2	Di-n-butylphthalate	11	U
206-44-0	Fluoranthene	11	U
129-00-0	Pyrene	11	U
85-68-7	Butylbenzylphthalate	11	U
91-94-1	3,3'-Dichlorobenzidine	11	U
56-55-3	Benzo(a)anthracene	11	U
218-01-9	Chrysene	11	U
117-81-7	bis(2-Ethylhexyl)phthalate	11 2	~~B~~ U
117-84-0	Di-n-octylphthalate	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U

(1) - Cannot be separated from Diphenylamine

1G

EPA SAMPLE NO.

GW01PB
MB-10

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-5

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-5A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

Number TICs found: 6 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	6.74	3	J
2.	128-37-0	BUTYLATED HYDROXYTOLUENE	10.70	3	NJ
3.		UNKNOWN	11.69	4	J
4.		UNKNOWN	14.99	10	J
5.	57-11-4	OCTADECANOIC ACID	16.46	11	NJ
6.	*	~~UNKNOWN~~	~~22.76~~	~~20~~	~~J~~
7.					
8.					
9.					
10.					
11.	* see	Alkane Narrative Report			
12.					
13.			CAErikson 7/21/03		
14.					
15.					
16.					
17.					
18.					
19.					
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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB FB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	11	U
108-95-2	Phenol	11	U
111-44-4	bis(2-Chloroethyl)ether	11	U
95-57-8	2-Chlorophenol	11	U
95-48-7	2-Methylphenol	11	U
108-60-1	2,2'-oxybis(1-Chloropropane)	11	U
98-86-2	Acetophenone	11	U
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-di-n-propylamine	11	U
67-72-1	Hexachloroethane	11	U
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	U
88-75-5	2-Nitrophenol	11	U
105-67-9	2,4-Dimethylphenol	11	U
111-91-1	bis(2-Chloroethoxy)methane	11	U
120-83-2	2,4-Dichlorophenol	11	U
91-20-3	Naphthalene	11	U
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	U
105-60-2	Caprolactam	15	
59-50-7	4-Chloro-3-methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	U UJ
88-06-2	2,4,6-Trichlorophenol	11	U
95-95-4	2,4,5-Trichlorophenol	27	U
92-52-4	1,1'-Biphenyl	11	U CAL
91-58-7	2-Chloronaphthalene	11	U
88-74-4	2-Nitroaniline	27	U 5/21/03
131-11-3	Dimethylphthalate	11	U
606-20-2	2,6-Dinitrotoluene	11	U
208-96-8	Acenaphthylene	11	U
99-09-2	3-Nitroaniline	27	U
83-32-9	Acenaphthene	11	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB FB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	27	~~U~~ UJ
100-02-7	4-Nitrophenol	27	U
132-64-9	Dibenzofuran	11	U
121-14-2	2,4-Dinitrotoluene	11	U
84-66-2	Diethylphthalate	0.3	J
86-73-7	Fluorene	11	U
7005-72-3	4-Chlorophenyl-phenylether	11	U
100-01-6	4-Nitroaniline	27	U
534-52-1	4,6-Dinitro-2-methylphenol	27	U
86-30-6	N-nitrosodiphenylamine (1)	11	U
101-55-3	4-Bromophenyl-phenylether	11	U
118-74-1	Hexachlorobenzene	11	U
1912-24-9	Atrazine	11	U
87-86-5	Pentachlorophenol	27	U
85-01-8	Phenanthrene	11	U
120-12-7	Anthracene	11	U
86-74-8	Carbazole	11	U
84-74-2	Di-n-butylphthalate	~~0.5~~ 0.5	~~JB~~ U
206-44-0	Fluoranthene	11	U
129-00-0	Pyrene	11	U
85-68-7	Butylbenzylphthalate	~~0.6~~ 0.6	~~JB~~ U
91-94-1	3,3'-Dichlorobenzidine	11	U
56-55-3	Benzo(a)anthracene	11	U
218-01-9	Chrysene	11	U
117-81-7	bis(2-Ethylhexyl)phthalate	11	U
117-84-0	Di-n-octylphthalate	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U

(1) - Cannot be separated from Diphenylamine

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW09FBPB
FB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix: (soil/water) WATER Lab Sample ID: RZ1067-1

Sample wt/vol: 925 (g/mL) ML Lab File ID: RZ1067-1A70

Level: (low/med) LOW Date Received: 05/01/03

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:05/05/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/09/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Extraction: (Type) CONT

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	4.94	3	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
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26.					
27.					
28.					
29.					
30.					

ALKANE NARRATIVE REPORT
Report date : 05/14/2003
SDG: RZ1067

Client Sample ID: GW01PB Lab Sample ID: RZ1067-5 File ID: RZ1067-5A70

Compound	RT	Est. Conc.	Q
Unknown Alkane	16.65	3	J
Straight-Chain Alkane	17.24	6	J
Straight-Chain Alkane	17.78	11	J
Straight-Chain Alkane	18.29	11	J
Straight-Chain Alkane	18.76	14	J
Branched Alkane	19.23	11	J
Straight-Chain Alkane	19.75	20	J
Branched Alkane	20.33	13	J
Straight-Chain Alkane	21.01	22	J
Straight-Chain Alkane	21.81	13	J
Straight-Chain Alkane	23.80	12	J
Unknown Alkane	24.60	16	J
Unknown Alkane	25.40	8	J
Unknown Alkane	26.30	9	J
Unknown Alkane	22.76	20	J

CA Erikson 7/21/03

Client Sample ID: GW04PB Lab Sample ID: RZ1067-8 File ID: RZ1067-8A70

Compound	RT	Est. Conc.	Q
Unknown Alkane	6.74	4	J

TRILLIUM INC.

ATTACHMENT C

LIBRARY SEARCHES, PER SECTION XI
SDG No. RZ1067
Semivolatiles in Water
Marion Bragg Landfill - April 2003

Data File: /chem/5972hp70.i/DF030509A70.b/RZ1067-5A70.d

Date : 09-MAY-2003 18:22

Client ID: GW01PB

Instrument: 5972hp70.i

Sample Info:

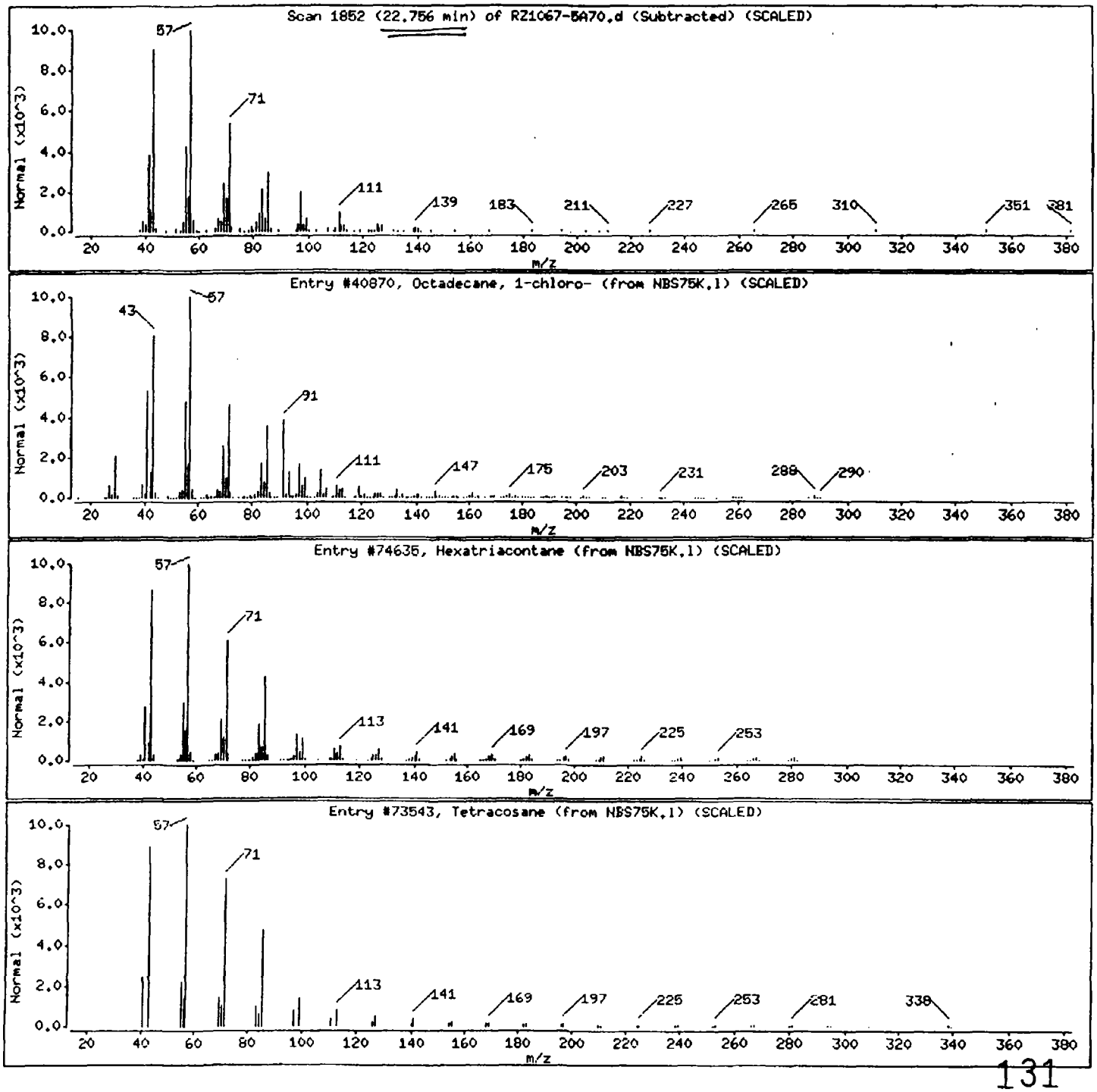
Volume Injected (uL): 2.0

Operator: 2519

Column phase: RTX-5MS

Column diameter: 0.25

Library Search Compound Match	CAS Number	Library	Entry	Quality	Formula	Weight
Unknown						
Octadecane, 1-chloro-	3386-33-2	NBS75K.l	40870	53	C18H37Cl	288
Hexatriacontane	630-06-8	NBS75K.l	74635	50	C36H74	507
Tetracosane	646-31-1	NBS75K.l	73543	50	C24H50	338



Data File: /chem/5972hp70.i/DF030512A70.b/RZ1067-10A70.d

Date : 12-MAY-2003 11:55

Client ID: GW06PB

Instrument: 5972hp70.i

Sample Info:

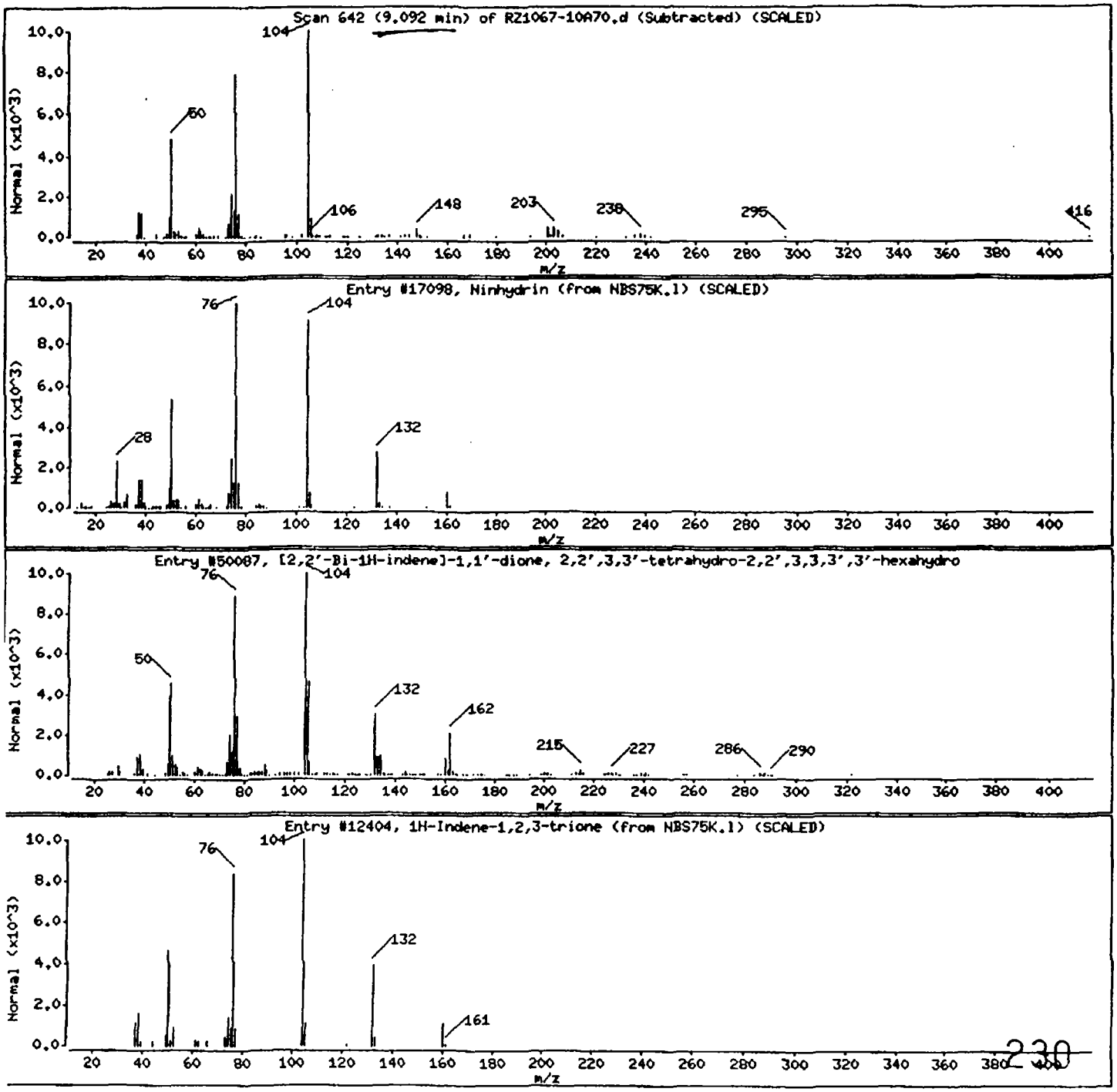
Volume Injected (uL): 2.0

Operator: 2519

Column phase: RTX-5MS

Column diameter: 0.25

Library Search Compound Match	CAS Number	Library	Entry	Quality	Formula	Weight
Ninhydrin	485-47-2	NBS75K.l	17098	91	C9H6O4	178
[2,2'-Bi-1H-indene]-1,1'-dione, 2,2',3,3	5950-69-6	NBS75K.l	50087	83	C18H14O8	358
1H-Indene-1,2,3-trione	938-24-9	NBS75K.l	12404	83	C9H4O3	160



DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA
Total Suspended Solids,
Chloride, and Ammonia in Water

Sample Delivery Group No. RX1067
April 2003 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

July 7, 2003

92241/CAE/ESC
\MARION\Apr032\WetChem1

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (total suspended solids [TSS], ammonia, and chloride) prepared by CompuChem Environmental for five water samples from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were issued by the laboratory in a single data package under Sample Delivery Group (SDG) No. RX1067, which was received for review on June 12, 2003, with additional information provided on July 7, 2003. The following field samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Based on the validation effort, the sample results were corrected as follows:

- Results for TSS in all five site samples were rounded to reflect two significant figures.
- Reporting limits for ammonia and TSS were adjusted to reflect two significant figures.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section X). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section IX.

This validation report should be considered part of the data package for all future distributions of the wet chemistry data.

INTRODUCTION

Analyses for the requested parameters were performed by the laboratory according to the following analytical methods:

Ammonia - EPA 350.1
Chloride - EPA 300.0
Total Suspended Solids (TSS) - EPA 160.2

These methods are found in "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79/020, Rev. 3/83.

Since no validation guidelines specific to the analytical methods used are available, the validation was based on the requirements of the referenced procedures, the specifications of the project-specific Quality Assurance Project Plan (QAPP) and best professional judgment. The validation approach was similar to that described in USEPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994).

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that each data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's validation guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: Analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data table in Attachment A and the Classical Chemistry Analyses Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The samples were collected 4/29/03. Analyses for all parameters were conducted within the holding times specified by the referenced methods and the QAPP (28 days from collection for chloride and ammonia; seven days from collection for TSS).

Physical preservation of all samples with ice was documented by the sampler on the applicable chain of custody (COC) record, and acceptable cooler temperatures (2.0-6.0°C; QC 4°C ±2°C) on laboratory receipt were also documented on the COC.

Chemical preservation of the samples for ammonia analysis with sulfuric acid was also clearly documented on the COC record, and acceptable pHs (<2) were recorded by the laboratory on the COC and on the applicable receiving log.

II. Calibrations

All samples were analyzed for chloride on 5/5/03. An initial calibration incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 50 mg/L was performed on 2/19/03 and documented in the data package. The reported correlation coefficient for the linear regression describing the best-fit curve was acceptable (>0.995) but could not be reproduced exactly by the validator, likely due to the weighting factor used by the laboratory. No action was necessary on this basis. ICV/CCV standards were run at appropriate frequencies during the chloride analysis series and all showed acceptable (QC 85-115%) recoveries relative to reported true values (99.8-102%).

The samples were analyzed for ammonia on 5/6/03. A calibration curve incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 8 mg/L was documented for this date. The reported correlation coefficient for the linear regression describing the best-fit curve for this IC was acceptable (>0.995) and was verified by the validator. ICV/CCV standards were run at appropriate frequencies during the ammonia analysis series and showed acceptable (QC 85-115%) recoveries relative to reported true values (101-104%). However, since only final results are displayed in the raw data documentation (i.e., absorbance values are not provided), these results cannot be verified by the validator.

Calibration is not applicable to the weight measurements used to determine TSS.

III. Blanks

No contamination was reported in any of the method blanks associated with the sample analyses; these results are supported by the raw data available in the data package.

No field-submitted blanks were included in this data set.

IV. Laboratory Control Samples

Laboratory control samples prepared and analyzed with the samples for all three analysis parameters showed acceptable recoveries (Lab QC 85-115%), ranging from 98.0-101%.

V. Laboratory Duplicate Analysis

Sample SW01PB was analyzed in duplicate for TSS by the laboratory. Excellent reproducibility was demonstrated by these paired analyses, with a relative percent difference (RPD) of 0%.

No laboratory duplicate analyses were performed for chloride or ammonia on any of the samples in this data set.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD analyses were performed on sample SW01PB for ammonia and chloride. Recoveries for ammonia (101% and 101%) and chloride (101% and 102%) were acceptable and measured concentrations showed excellent reproducibility, with RPDs of 0.2% and 0.6%, respectively (QC 80-120% Recovery and $\leq$20 RPD).

VII. Field Duplicates

Samples SW01PB and SW01DPPB were identified as a field duplicate pair. Positive paired results showed good reproducibility for chloride (2 RPD) and TSS (13 RPD). Ammonia was not detected in either sample; therefore, no further quantitative evaluation of precision could be made using these data.

VIII. Sample Results Verification

Results for TSS and chloride were correctly calculated and accurately reported for the samples in this data set based on review of the available raw data. Ammonia results were correctly transcribed from the raw data; since only direct readings of the final results were documented, no verification of the reported results could be made by the validator.

All samples were analyzed at 5-fold dilutions for chloride. Therefore, the reporting limit (RL) for this parameter on the data table in Attachment A was adjusted by the validator to reflect this dilution factor.

Sample results and RLs were reported to inconsistent significant figures and are not in accordance with previously-defined CompuChem policy, which states that values greater than 10 are reported to three significant figures and values less than 10 are reported to two significant figures. For consistency with historical data generated in support of this project, all results greater than or equal to 10 mg/L were adjusted to reflect three significant figures and values less than 10 mg/L (including RLs) were adjusted to reflect two significant figures, where necessary. Specifically, the following actions were taken:

- The positive results for TSS in all five samples were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.

- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

The data table in Attachment A lists all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation effort.

IX. Documentation

A chain of custody (COC) record present in the data package included all reported samples. The following issues were noted:

- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. The airbill number, however, was documented on the COC record.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

For ammonia, absorbance readings were provided for the IC standards but only direct readings of the final results were documented in the raw data for all runs performed during the sample

analysis series. Therefore, the results reported for these analyses could not be verified by the validator. At the discretion of the data user, the laboratory may be requested to provide this documentation in future data packages prepared in support of this project.

The true values for chloride in the ion chromatography ICV/CCV standards were not documented in the data package. At the request of the validator, these values were provided by the laboratory via facsimile on 7/7/03 (see Attachment C).

Most of these documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

X. Overall Assessment

Sample results for the three wet chemistry parameters were corrected as follows based on the validation effort:

- Results for TSS in all five site samples were rounded to reflect two significant figures (instead of three significant figures, as reported by the laboratory).
- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

Documentation issues are discussed in Section IX.

This validation report should be considered part of the data package for all future distributions of the wet chemistry data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLE

Wet Chemistry - SDG No. RX1067
April 2003 Sample Collections - Marion Bragg Landfill

Marion Bragg Landfill - April 2003 - Wet Chemistry Parameters in Surface Water

Results are in mg/L

Collection Point		PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID		PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No.		RX1067-5	RX1067-1	RX1067-2	RX1067-3	RX1067-4
Collection Date		4/29/03	4/29/03	4/29/03	4/29/03	4/29/03
	RL					
Ammonia	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chloride	2.0	17.1	41.2	40.5	40.3	53.8
Total Suspended Solids	1.0	6.4	4.8	4.2	2.2	2.0

TRILLIUM INC.

ATTACHMENT B

CLASSICAL CHEMISTRY ANALYSES DATA SHEETS (FORM Is)

Wet Chemistry - SDG No. RX1067
April 2003 Sample Collections - Marion Bragg Landfill

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

PW01PB

PW-1

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-5

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	6.4 ~~5.40~~				5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
Chloride	17.1				5/5/03

CErikson 7/8/03

Comments:

2

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-1 SW01PB

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-1

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	41.2				5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
TSS	4.8 ~~4.80~~				5/5/03

CAE 7/8/03

Comments:

4

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-2

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	4.2 ~~4.20~~				5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
Chloride	40.5				5/5/03

CAE 7/8/03

Comments:

3

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW02PB SW-5

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-3

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	2.2 ~~2.20~~				5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
Chloride	40.3				5/5/03

CAE 7/8/03

Comments:

5

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW03PB
SW-6

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-4

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	2.0 ~~2.00~~				5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
Chloride	53.8				5/5/03

CAE 7/8/03

Comments:

TRILLIUM INC.

ATTACHMENT C

CHLORIDE TRUE VALUES, AS PROVIDED BY THE LABORATORY ON 7/7/03

Wet Chemistry - SDG No. RX1067
April 2003 Sample Collections - Marion Bragg Landfill

True Values for IC Analysis

	ICV	LCSW	CCV	MS & MSD
Fluoride	2.50	2.500	2.50	5.00
Chloride	20.00	25.00	25.00	40.00
Nitrite	2.50	2.500	2.50	5.00
Bromide	2.50	2.500	2.50	5.00
Nitrate	2.50	2.500	2.50	5.00
Phosphate	2.50	2.500	2.50	5.00
Sulfate	20.00	50.00	50.00	40.00

501 Madison Avenue, Cary, North Carolina 27513
Phone: (919) 379-4005 □ Fax: (919) 379-4050

CompuChem
Cary, North Carolina

Priority Memo

To: Carol Erickson	**From:** Rodney A. Raimonde
	Pages with cover 2
Fax: 865-966-8885	**Date:** 7/7/03
Re: Tenn Values	**CC:**

☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Thank you.

Rodney A. Raimonde
919-379-4018 (direct)
919-379-4040 (fax)
rraimonde@compuchemlabs.com

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA
Total Suspended Solids,
Chloride, and Ammonia in Water

Sample Delivery Group No. RZ1067
April 2003 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

July 15, 2003

92241/CAE/ESC
\MARION\Apr03\WetChem2

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (total suspended solids [TSS], ammonia, and chloride) prepared by CompuChem Environmental for nine water samples and one field blank (FB) from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were issued by the laboratory in a single data package under Sample Delivery Group (SDG) No. RZ1067, which was received for review on July 8, 2003. The following field samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

Based on the validation effort, the sample results were qualified or corrected as follows:

- Results for ammonia in GW08PB and GW08DPPB were rejected (R).
- Results for ammonia in all samples were rounded to reflect two significant figures.
- Results for TSS in GW03PB and GW04PB samples were rounded to reflect two significant figures.
- Reporting limits for ammonia and TSS were adjusted to reflect two significant figures.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section X). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section IX.

This validation report should be considered part of the data package for all future distributions of the wet chemistry data.

INTRODUCTION

Analyses for the requested parameters were performed by the laboratory according to the following analytical methods:

Ammonia - EPA 350.1
Chloride - EPA 300.0
Total Suspended Solids (TSS) - EPA 160.2

These methods are found in "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79/020, Rev. 3/83.

Since no validation guidelines specific to the analytical methods used are available, the validation was based on the requirements of the referenced procedures, the specifications of the project-specific Quality Assurance Project Plan (QAPP) and best professional judgment. The validation approach was similar to that described in USEPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994).

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that each data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's validation guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: Analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables in Attachment A and the Classical Chemistry Analyses Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The samples were collected 4/30/03. Analyses for all parameters were conducted within the holding times specified by the referenced methods and the QAPP (28 days from collection for chloride and ammonia; seven days from collection for TSS).

Physical preservation of all samples with ice was documented by the sampler on the applicable chain of custody (COC) records, and acceptable cooler temperatures (2.0-6.0°C; QC 4°C ±2°C) on laboratory receipt were also documented on the COCs.

Chemical preservation of the samples for ammonia analysis with sulfuric acid was also clearly documented on the COC record, and acceptable pHs (<2) were recorded by the laboratory on the COCs and on the applicable receiving logs.

II. Calibrations

All samples were analyzed for chloride on 5/5/03. An initial calibration incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 50 mg/L was performed on 2/19/03 and documented in the data package. The reported correlation coefficient for the linear regression describing the best-fit curve was acceptable (>0.995) but could not be reproduced exactly by the validator, likely due to the weighting factor used by the laboratory. No action was necessary on this basis. ICV/CCV standards were run at appropriate frequencies during the chloride analysis series and all showed acceptable (QC 85-115%) recoveries relative to reported true values (99.8-102%).

The samples were analyzed for ammonia on 5/6/03. A calibration curve incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 8 mg/L was documented for this date. The reported correlation coefficient for the linear regression describing the best-fit curve for this IC was acceptable (>0.995) and was verified by the validator. ICV/CCV standards were run at appropriate frequencies during the ammonia analysis series and showed acceptable (QC 85-115%) recoveries relative to reported true values (101-104%). However, since only final results are displayed in the raw data documentation (i.e., absorbance values are not provided), these results cannot be verified by the validator.

Calibration is not applicable to the weight measurements used to determine TSS.

III. Blanks

No contamination was reported in any of the method blanks associated with the sample analyses; these results are supported by the raw data available in the data package.

One field blank (GW08FBPB) was submitted with this data set. No contamination was reported in this field-submitted blank.

IV. Laboratory Control Samples

Laboratory control samples prepared and analyzed with the samples for all three analysis parameters showed acceptable recoveries (Lab QC 85-115%), ranging from 98.0-101%.

V. Laboratory Duplicate Analysis

Sample GW08PB was analyzed in duplicate for TSS by the laboratory. Excellent reproducibility was demonstrated by these paired analyses, with a relative percent difference (RPD) of 5%.

No laboratory duplicate analyses were performed for chloride or ammonia on any of the samples in this data set.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD analyses were performed on sample GW08PB for ammonia and chloride. Recoveries for ammonia (98.5% and 98.8%) and chloride (92.3% and 93.5%) were acceptable and measured concentrations showed excellent reproducibility, with RPDs of 0.8% and 0.3%, respectively (QC 80-120% Recovery and ≤20 RPD).

VII. Field Duplicates

Samples GW08PB and GW08DPPB were identified as a field duplicate pair. Positive paired results showed excellent reproducibility for chloride (5 RPD) and TSS (6 RPD). Ammonia was reported in GW08DPPB (0.28 µg/L) but was not found above the reporting limit in GW08PB (0.10 µg/L U). Based on this lack of confirmation at a significant concentration, results for ammonia in GW08PB and GW08DPPB were rejected (R) as unreliable.

VIII. Sample Results Verification

Results for TSS and chloride were correctly calculated and accurately reported for the samples in this data set based on review of the available raw data. Ammonia results were correctly

transcribed from the raw data; since only direct readings of the final results were documented, no verification of the reported results could be made by the validator.

All samples were analyzed at 5-fold dilutions for chloride. Therefore, the reporting limit (RL) for this parameter on the data tables in Attachment A was adjusted by the validator to reflect this dilution factor.

Sample results and RLs were reported to inconsistent significant figures and are not in accordance with previously-defined CompuChem policy, which states that values greater than 10 are reported to three significant figures and values less than 10 are reported to two significant figures. For consistency with historical data generated in support of this project, all results greater than or equal to 10 mg/L were adjusted to reflect three significant figures and values less than 10 mg/L (including RLs) were adjusted to reflect two significant figures, where necessary. Specifically, the following actions were taken:

- The positive results for ammonia in all samples were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.

- The positive results for TSS in GW03PB and GW04PB were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.

- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation effort.

IX. Documentation

Three chain of custody (COC) records present in the data package included all reported samples. The following issues were noted:

- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. The airbill number, however, was documented on each of the COC records.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been

provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

For ammonia, absorbance readings were provided for the IC standards but only direct readings of the final results were documented in the raw data for all runs performed during the sample analysis series. Therefore, the results reported for these analyses could not be verified by the validator. At the discretion of the data user, the laboratory may be requested to provide this documentation in future data packages prepared in support of this project.

The true values for chloride in the ion chromatography ICV/CCV standards were not documented in either wet chemistry data package applicable to this sampling effort. At the request of the validator with respect to the first wet chemistry package reviewed, these values were provided by the laboratory via facsimile on 7/7/03 (see Attachment C).

Some of these documentation issues could be problematic if the data were to be used in litigation.

X. Overall Assessment

Sample results for the three wet chemistry parameters were qualified or corrected as follows based on the validation effort:

- Results for ammonia in GW08PB and GW08DPPB were rejected (R) as unreliable based on lack of confirmation at a significant concentration in the field duplicate analyses.
- Results for ammonia in all samples were rounded to reflect two significant figures (instead of three significant figures, as reported by the laboratory).
- Results for TSS in GW03PB and GW04PB samples were rounded to reflect two significant figures (instead of three significant figures, as reported by the laboratory).
- RLs for ammonia and TSS were adjusted to reflect two significant figures (instead of three or four, as reported by the laboratory).

Documentation issues are discussed in Section IX.

This validation report should be considered part of the data package for all future distributions of the wet chemistry data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES

Wet Chemistry - SDG No. RZ1067
April 2003 Sample Collections - Marion Bragg Landfill

Marion Bragg Landfill - April 2003 - Wet Chemistry Parameters in Ground Water

Results are in mg/L

Collection Point		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No.		RZ1067-3	RZ1067-4	RZ1067-2	RZ1067-7	RZ1067-8	RZ1067-9	RZ1067-10	RZ1067-6
Collection Date		4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
	RL								
Ammonia	0.10	R	R	7.6	1.7	3.6	5.1	4.1	0.43
Chloride	2.0	22.9	21.8	21.3	20.9	17.8	20.8	39.7	14.0
Total Suspended Solids	1.0	17.4	16.4	62.0	8.8	5.2	33.6	17.2	36.4

Marion Bragg Landfill - April 2003 - Wet Chemistry Parameters in Ground Water

Results are in mg/L

Collection Point		MB-10	Field Blank
Sample ID		GW01PB	GW09FBPB
Lab Sample No.		RZ1067-5	RZ1067-1
Collection Date		4/30/03	4/30/03
	RL		
Ammonia	0.10	0.10 U	0.10 U
Chloride	2.0	27.8	2.0 U
Total Suspended Solids	1.0	25.4	1.0 U

TRILLIUM INC.

ATTACHMENT B

CLASSICAL CHEMISTRY ANALYSES DATA SHEETS (FORM Is)

Wet Chemistry - SDG No. RZ1067
April 2003 Sample Collections - Marion Bragg Landfill

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-1 GW08PB

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-3

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	17.4				5/5/03
Ammonia	R ~~0.100~~	~~U~~			5/6/03
Chloride	22.9				5/5/03

CAErikson 7/15/03

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-1D GW08DPFB

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-4

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	16.4				5/5/03
Ammonia	R ~~0.280~~				5/6/03
Chloride	21.8				5/5/03

CAE 7/16/03

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-2 GW07PB

Lab Name: CompuChem Contract: _____

Lab Code: LIBRTY Case No.: _____ NRAS No.: _____

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-2

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	62.0				5/5/03
Ammonia	7.6 ~~7.64~~				5/6/03
Chloride	21.3				5/5/03

CAE 7/15/03

Comments: _____

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW03PB MB-5

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-7

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	8.8 ~~8.80~~				5/5/03
Ammonia	1.7 ~~1.70~~				5/6/03
Chloride	20.9				5/5/03

CAE 7/15/03

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW04PB MB-6

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-8

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	5.2 ~~5.20~~				5/5/03
Ammonia	3.6 ~~3.57~~				5/6/03
Chloride	17.8				5/5/03

CAE 7/15/03

Comments:

5

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-7 GW05PB

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-9

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	33.6				5/5/03
Ammonia	5.1 ~~5.11~~				5/6/03
Chloride	20.8				5/5/03

CAE 7/15/03

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW06PB MB-8

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-10

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	17.2				5/5/03
Ammonia	4.1 ~~4.07~~				5/6/03
Chloride	39.7				5/5/03

CAE 7/15/03

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-9 GW02PB

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-6

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	36.4				5/5/03
Ammonia	0.43 ~~0.434~~				5/6/03
Chloride	14.0				5/5/03

CAE 7/15/03

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW01PB MB-10

Lab Name: CompuChem Contract: _____

Lab Code: LIBRTY Case No.: _____ NRAS No.: _____

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-5

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	25.4				5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
Chloride	27.8				5/5/03

CAE 7/15/03

Comments: _____

2

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW09FBPB Field Blank

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-1

Date Received: 5/1/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	1.0 ~~1.00~~	U			5/5/03
Ammonia	0.10 ~~0.100~~	U			5/6/03
Chloride	2.0 ~~2.00~~	U			5/5/03

CAE 7/15/03

Comments:

TRILLIUM INC.

ATTACHMENT C

CHLORIDE TRUE VALUES, AS PROVIDED BY THE LABORATORY ON 7/7/03

Wet Chemistry - SDG No. RZ1067
April 2003 Sample Collections - Marion Bragg Landfill

True Values for IC Analysis

	ICV	LCSW	CCV	MS & MSD
Fluoride	2.50	2.500	2.50	5.00
Chloride	20.00	25.00	25.00	40.00
Nitrite	2.50	2.500	2.50	5.00
Bromide	2.50	2.500	2.50	5.00
Nitrate	2.50	2.500	2.50	5.00
Phosphate	2.50	2.500	2.50	5.00
Sulfate	20.00	50.00	50.00	40.00

501 Madison Avenue, Cary, North Carolina 27513
Phone: (919) 379-4005 □ Fax: (919) 379-4050

CompuChem
Cary, North Carolina

Priority Memo

To: Carol Erickson — From: Rodney A. Raimonde

Pages with cover 2

Fax: 865-966-8885 — Date: 7/2/03

Re: True Values — CC:

☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Thank you,

Rodney A. Raimonde
919-379-4018 (direct)
919-379-4040 (fax)
rraimonde@compuchemlabs.com

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

INORGANIC ANALYSIS DATA
Dissolved Metals in Water

SDG No. RZ1067
Samples Collected April 2003

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 5, 2003

92241/CAE/EKD
MARION\Apr03\DMetals2

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for nine water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RZ1067, which was received for review on June 12, 2003. The following samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for thallium and zinc in all samples were qualified as estimated (UJ).
- Results for aluminum in GW02PB, GW03PB, GW04PB, GW06PB, GW01PB, and GW09FBPB were qualified as less than the reported values (U).
- The result for beryllium in GW09FBPB was qualified as less than the reported value (U).
- Results for cobalt in GW03PB, GW04PB, and GW06PB were qualified as less than the reported values (U).
- Results for iron and manganese in GW01PB were qualified as less than the reported values (U).
- Results for vanadium in GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U).
- Results for calcium, magnesium, and sodium in GW09FBPB were qualified as estimated (J, UJ).
- Results for chromium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U).
- The result for selenium in GW06PB was qualified as estimated (J).

- Results for potassium in all samples except GW09FBPB were qualified as estimated (J).
- Results for nickel in GW08PB, GW08DPPB, GW07PB, GW06PB, GW05PB, and GW01PB were qualified as estimated (J).
- Results for cobalt in GW08PB and GW07PB were qualified as estimated (J).
- The result for vanadium in GW08PB was qualified as estimated (J).

All "B," "N," and "E" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.1. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: The analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The ground water samples and field blank were collected on 4/30/03. All metals analyses were conducted on 5/8/03 and 5/9/03, well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the ground water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) records. A "B" (for "both") was recorded on each COC in the field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the ground water samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COCs. Acceptable cooler temperatures (2-6°C) on laboratory receipt were recorded on all three COCs and on the laboratory's receiving logs. Acceptable sample pHs (<2) were also documented on the COCs as well as on on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

According to the data package narrative, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 5/9/03 on an instrument identified as "P3." Mercury analyses were performed in a single CVAA series run on 5/8/03 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). Recoveries were acceptable (80-120%) in the three CRDL standards associated with the sample analyses except for zinc (69.6%, 71.0%, and 70.6%). Results for zinc in all samples were qualified as estimated (UJ) based on the unacceptably low CRDL standard recoveries.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard was acceptable.

III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of nine different elements (aluminum, barium, beryllium, cadmium, chromium, cobalt, iron, magnesium, and vanadium) in each of the initial and continuing calibration blanks (ICB/CCBs); in addition, results for calcium and zinc were below the negative IDLs in many of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank value. The following sample results were qualified as less than the reported values (U) due to contamination in the associated calibration blanks:

- Aluminum in GW02PB, GW03PB, GW04PB, GW06PB, GW01PB, and GW09FBPB.
- Beryllium in GW09FBPB.
- Cobalt in GW03PB, GW04PB, and GW06PB.
- Iron in GW01PB.
- Vanadium in GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, and GW06PB.

The following sample results were qualified as estimated (J, UJ) based on negative responses in the associated calibration blanks:

- Calcium and magnesium in GW09FBPB.
- Zinc in all samples.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for barium (0.30 µg/L), calcium (-46.23 µg/L), chromium (0.67 µg/L), iron (31.88 µg/L), manganese (0.98 µg/L), and zinc (-2.29 µg/L) were reported in the preparation blank. The following sample results were qualified as less than the reported values (U) based on associated preparation blank contamination:

- Chromium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB.
- Iron and manganese in GW01PB.

The following sample results were qualified as estimated (J, UJ) due to negative responses in the preparation blank:

- Calcium in GW09FBPB.
- Zinc in all samples.

Some of the actions warranted based on PBW responses are redundant with actions taken based on ICB/CCB results; no additional action was taken in these cases.

One field blank, GW09FBPB, was prepared in association with this data set. After qualifications based on laboratory blank contamination, magnesium (11.8 µg/L) and sodium (536 µg/L) were detected in this field-submitted blank. No sample results were affected by these field blank values.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery).

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample GW08PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in GW08PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample GW08PB with acceptable recoveries (75-125%) for all target elements except selenium (131.3%) and thallium (64.8%). Results for thallium in all samples in this data set were qualified as estimated (UJ) based on the unacceptably low matrix spike recovery for this element. The result for selenium in GW06PB was qualified as estimated (J) based on the unacceptably high matrix spike recovery for this element. Selenium was not detected in any other samples in this data set, therefore no additional qualifiers were necessary based on the matrix spike results.

The "N" flags appropriately applied by the laboratory to all sample results for selenium and thallium were removed by the validator.

VIII. ICP Serial Dilution

Serial dilution analysis was performed on sample GW08PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference) except for potassium (16.9%). Results for potassium in all samples except GW09FBPB were qualified as estimated (J) based on this serial dilution result.

The "E" flags appropriately applied by the laboratory to all sample results for potassium were removed by the validator.

IX. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for arsenic (8.0 RPD), barium (0.5 RPD), calcium (0 RPD), cobalt (0 RPD), iron (0.6 RPD), magnesium (0 RPD), manganese (0.1 RPD), potassium (0.4 RPD), sodium (0.7 RPD), and vanadium (4.4 RPD), but exceeded the QAPP-specified acceptance limit for nickel (42.6 RPD). Results for nickel in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 4/15/03 for all ICP elements on P3 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations just slightly above the applicable IDLs. Many of these results were subsequently qualified for reasons previously discussed; no additional action was necessary in these cases. Those sample results that were not so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The following results were qualified on this basis:

- Cobalt in GW08PB (23.5%) and GW07PB (26.8%).
- Nickel in GW07PB (26.0%) and GW06PB (33.2%).
- Vanadium in GW08PB (29.6%).
- Sodium in GW09FBPB (31.8%).

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). Results for nickel in GW05PB and GW01PB were so qualified on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The three applicable chain of custody (COC) records were present in the data package and included all samples reported in this SDG. The following issues were noted:

- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

These COC documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RZ1067 and were qualified as follows:

- Results for zinc in all samples were qualified as estimated (UJ) based on unacceptably low recoveries in the associated CRDL standards and due to negative responses in the associated calibration and preparation blanks.

- Results for aluminum in GW02PB, GW03PB, GW04PB, GW06PB, GW01PB, and GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.

- The result for beryllium in GW09FBPB was qualified as less than the reported value (U) based on contamination in the associated calibration blank.

- Results for cobalt in GW03PB, GW04PB, and GW06PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.

- The result for iron in GW01PB was qualified as less than the reported value (U) based on contamination in the associated calibration and preparation blanks.

- Results for vanadium in GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.

- Results for calcium and magnesium in GW09FBPB were qualified as estimated (J, UJ) based on negative responses in the associated calibration blank. The result for calcium

in GW09FBPB was similarly qualified based on a negative response in the associated preparation blank.

- Results for chromium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U) based on contamination in the associated preparation blank.

- The result for manganese in GW01PB was qualified as less than the reported value (U) based on contamination in the associated preparation blank.

- Results for thallium in all samples in this data set were qualified as estimated (UJ) based on an unacceptably low matrix spike recovery for this element.

- The result for selenium in GW06PB was qualified as estimated (J) based on an unacceptably high matrix spike recovery for this element.

- Results for potassium in all samples except GW09FBPB were qualified as estimated (J) based on an unacceptable serial dilution result for this analyte.

- Results for nickel in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

- Results for cobalt in GW08PB and GW07PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

- Results for nickel in GW07PB and GW06PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

- The result for vanadium in GW08PB was qualified as estimated (J) based on an elevated %RSD value among the triplicate ICP measurements.

- The result for sodium in GW09FBPB was qualified as estimated (J) based on an elevated %RSD value among the triplicate ICP measurements.

- Results for nickel in GW05PB and GW01PB were qualified as estimated (J) because they are less than 2x IDL and were not otherwise qualified.

All "B," "N," and "E" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
SDG No. RZ1067
Dissolved Metals in Water

Marion Bragg Landfill - April 2003 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

Collection Point ==>		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID ==========>		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ==>		RZ1067-3	RZ1067-4	RZ1067-2	RZ1067-7	RZ1067-8	RZ1067-9	RZ1067-10	RZ1067-6
Collection Date. ==>		4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
	CRDL								
Aluminum	200	40.9 U	40.9 U	40.9 U	57.9 U	45.3 U	40.9 U	64.8 U	52.7 U
Antimony	60	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Arsenic	10	6.0	6.5	77.7	33.4	122	64.1	118	6.2
Barium	200	192	191	627	365	410	540	248	68.6
Beryllium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	5000	119000	11900	167000	98200	121000	88900	92700	57000
Chromium	10	0.69 U	1.1 U	0.80 U	0.74 U	1.1 U	1.1 U	1.5 U	0.60 U
Cobalt	50	2.2 J	2.2	1.3 J	2.2 U	2.6 U	0.70 U	1.4 U	0.70 U
Copper	25	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Iron	100	1670	1660	26900	9410	16400	8300	10200	2210
Lead	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Magnesium	5000	34000	34000	39200	54700	30200	31400	72500	21900
Manganese	15	928	927	266	184	79.2	67.4	109	488
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	40	3.7 J	2.4 J	2.4 J	2.7	12.5	1.2 J	2.5 J	1.2 U
Potassium	5000	2330 J	2340 J	11100 J	3610 J	9010 J	12700 J	18500 J	1200 J
Selenium	5	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	3.1 J	2.3 U
Silver	10	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U
Sodium	5000	14500	14600	19100	26200	18800	37000	60700	10100
Thallium	10	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ	2.9 UJ
Vanadium	50	2.2 J	2.3	2.5	2.5 U	2.4 U	1.8 U	3.3 U	1.4 U
Zinc	20	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ

Marion Bragg Landfill - April 2003 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

Collection Point ==>		MB-10		Field Blank	
Sample ID ==========>		GW01PB		GW09FBPB	
Lab Sample No. ==>		RZ1067-5		RZ1067-1	
Collection Date. ==>		4/30/03		4/30/03	
	CRDL				
Aluminum	200	42.4	U	43.9	U
Antimony	60	2.5	U	2.5	U
Arsenic	10	2.2	U	2.2	U
Barium	200	97.0		0.20	U
Beryllium	5	0.20	U	0.21	U
Cadmium	5	0.20	U	0.20	U
Calcium	5000	112000		15.7	UJ
Chromium	10	0.60	U	0.60	U
Cobalt	50	0.70	U	0.70	U
Copper	25	1.6	U	1.6	U
Iron	100	55.2	U	14.2	U
Lead	3	1.4	U	1.4	U
Magnesium	5000	35400		11.8	J
Manganese	15	3.0	U	0.20	U
Mercury	0.2	0.10	U	0.10	U
Nickel	40	1.4	J	1.2	U
Potassium	5000	2190	J	28.6	U
Selenium	5	2.3	U	2.3	U
Silver	10	0.90	U	0.90	U
Sodium	5000	15500		536	J
Thallium	10	2.9	UJ	2.9	UJ
Vanadium	50	2.1	U	0.80	U
Zinc	20	1.5	UJ	1.5	UJ

TRILLIUM INC.

ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RZ1067
Dissolved Metals in Water

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-1 GW08PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-3

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.9	U		P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	6.0	B		P
7440-39-3	Barium	192	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	119000			P
7440-47-3	Chromium	0.69	B	U	P
7440-48-4	Cobalt	2.2	B	J	P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	1670			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	34000			P
7439-96-5	Manganese	928			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	3.7	B	J	P
7440-09-7	Potassium	2330	B	EJ	P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	14500			P
7440-28-0	Thallium	2.9	B	N UJ	P
7440-62-2	Vanadium	2.2	B	J	P
7440-66-6	Zinc	1.5	U	UJ	P

CAE 7/5/03 Calcium

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-1D GW08DPPB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-4

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.9	U		P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	6.5	B		P
7440-39-3	Barium	191	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	119000			P
7440-47-3	Chromium	1.1	B	U	P
7440-48-4	Cobalt	2.2	B		P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	1660			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	34000			P
7439-96-5	Manganese	927			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.4	B	J	P
7440-09-7	Potassium	2340	B	J	P
7782-49-2	Selenium	2.3	U		P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	14600			P
7440-28-0	Thallium	2.9	B	UJ	P
7440-62-2	Vanadium	2.3	B		P
7440-66-6	Zinc	1.5	U	UJ	P

CAE 7/5/03 Calculation

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
MB-2 GW07PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-2

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.9	U		P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	77.7			P
7440-39-3	Barium	627			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	167000			P
7440-47-3	Chromium	0.80	B	U	P
7440-48-4	Cobalt	1.3	B	J	P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	26900			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	39200			P
7439-96-5	Manganese	266			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.4	B	J	P
7440-09-7	Potassium	11100		BJ	P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	19100			P
7440-28-0	Thallium	2.9	B	NUJ	P
7440-62-2	Vanadium	2.5	B		P
7440-66-6	Zinc	1.5	B	UJ	P

ALE 7/5/03 CASWIKSON

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-5 GW03PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-7

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	57.9	B	U	P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	33.4			P
7440-39-3	Barium	365			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	98200			P
7440-47-3	Chromium	0.74	B	U	P
7440-48-4	Cobalt	2.2	B	U	P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	9410			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	54700			P
7439-96-5	Manganese	184			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.7	B		P
7440-09-7	Potassium	3610	B	EJ	P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	26200			P
7440-28-0	Thallium	2.9	B	UJ	P
7440-62-2	Vanadium	2.5	B	U	P
7440-66-6	Zinc	1.5	B	UJ	P

CME 7/5/03 MGWilkson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-6 GW04PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-8

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	45.3	B	U	P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	122			P
7440-39-3	Barium	410			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	121000			P
7440-47-3	Chromium	1.1	B	U	P
7440-48-4	Cobalt	2.6	B	U	P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	16400			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	30200			P
7439-96-5	Manganese	79.2			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	12.5	B		P
7440-09-7	Potassium	9010		EJ	P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	18800			P
7440-28-0	Thallium	2.9	B	NUJ	P
7440-62-2	Vanadium	2.4	B	U	P
7440-66-6	Zinc	1.5	B	UJ	P

CAE 7/5/03 CAGUKSON

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-7 GW05PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-9

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.9	U		P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	64.1			P
7440-39-3	Barium	540			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	88900			P
7440-47-3	Chromium	1.1	B	U	P
7440-48-4	Cobalt	0.70	U		P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	8300			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	31400			P
7439-96-5	Manganese	67.4			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.2	B	J	P
7440-09-7	Potassium	12700		EJ	P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	37000			P
7440-28-0	Thallium	2.9	U	NUJ	P
7440-62-2	Vanadium	1.8	B	U	P
7440-66-6	Zinc	1.5	U	UJ	P

CAE 7/5/03 CA Erikson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-8 GW06PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-10

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	64.8	B	U	P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	118			P
7440-39-3	Barium	248			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	92700			P
7440-47-3	Chromium	1.5	B	U	P
7440-48-4	Cobalt	1.4	B	U	P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	10200			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	72500			P
7439-96-5	Manganese	109			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.5	B	J	P
7440-09-7	Potassium	18500		E J	P
7782-49-2	Selenium	3.1	B	N J	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	60700			P
7440-28-0	Thallium	2.9	U	N UJ	P
7440-62-2	Vanadium	3.3	B	U	P
7440-66-6	Zinc	1.5	B	UJ	P

CAE 7/5/03 CA Erickson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-9 GW02PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-6

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	52.7	B	U	P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	6.2	B		P
7440-39-3	Barium	68.6	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	57000			P
7440-47-3	Chromium	0.60	U		P
7440-48-4	Cobalt	0.70	U		P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	2210			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	21900			P
7439-96-5	Manganese	488			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.2	U		P
7440-09-7	Potassium	1200	B	J	P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	10100			P
7440-28-0	Thallium	2.9	B	UJ	P
7440-62-2	Vanadium	1.4	B	U	P
7440-66-6	Zinc	1.5	B	UJ	P

CAE 7/6/03 Caution

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-10 GW01PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-5

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	42.4	B	U	P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	2.2	U		P
7440-39-3	Barium	97.0	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	112000			P
7440-47-3	Chromium	0.60	U		P
7440-48-4	Cobalt	0.70	U		P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	55.2	B	U	P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	35400			P
7439-96-5	Manganese	3.0	B	U	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.4	B	J	P
7440-09-7	Potassium	2190	B	E J	P
7782-49-2	Selenium	2.3	U	W	P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	15500			P
7440-28-0	Thallium	2.9	B	W UJ	P
7440-62-2	Vanadium	2.1	B	U	P
7440-66-6	Zinc	1.5	B	UJ	P

CAE 7/5/03 Carlson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

FB GW09FBPB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RZ1067

Matrix (soil/water): WATER Lab Sample ID: RZ1067-1

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	43.9	B	U	P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	2.2	U		P
7440-39-3	Barium	0.20	U		P
7440-41-7	Beryllium	0.21	B	U	P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	15.7	B	UJ	P
7440-47-3	Chromium	0.60	U		P
7440-48-4	Cobalt	0.70	U		P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	14.2	U		P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	11.8	B	J	P
7439-96-5	Manganese	0.20	U		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.2	U		P
7440-09-7	Potassium	28.6	U		P
7782-49-2	Selenium	2.3	U		P
7440-22-4	Silver	0.90	U		P
7440-23-5	Sodium	536	B	J	P
7440-28-0	Thallium	2.9	N	UJ	P
7440-62-2	Vanadium	0.80	U		P
7440-66-6	Zinc	1.5	B	UJ	P

CAE 7/5/03 Carlson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

INORGANIC ANALYSIS DATA
Dissolved Metals in Water

SDG No. RX1067
Samples Collected April 2003

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

July 3, 2003

92241/CAE/PSN
MARION\Apr03\DMetals1

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for five surface water samples from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RX1067, which was received for review on June 12, 2003. The following samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for arsenic and thallium in all site samples were qualified as estimated (UJ).
- Results for chromium in SW02PB, SW03PB, and PW01PB were qualified as estimated (UJ).
- Results for cobalt in PW01PB and SW03PB were qualified as less than the reported values (U).
- Results for nickel in all samples were qualified as less than the reported values (U).
- Results for cadmium in SW01DPPB, SW02PB, and SW03PB were qualified as estimated (UJ).
- Results for cadmium and selenium in SW01PB were qualified as less than the CRDLs (5.0 U).
- Results for copper and vanadium in SW01DPPB were qualified as less than the CRDLs (25.0 U, and 50.0 U, respectively).
- Results for lead in SW01PB and SW01DPPB were rejected (R).
- The result for copper in PW01PB was qualified as estimated (J).

All "B" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.1. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: The analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The surface water samples were collected on 4/29/03. All metals analyses were conducted on 5/7/03 and 5/8/03, well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the surface water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) record. A "B" (for "both") was recorded in the COC field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COC. Acceptable cooler temperatures (2-6°C) on laboratory receipt were recorded on the COC and on the laboratory's receiving log. Acceptable sample pHs (<2) were also documented on the COC as well as on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

According to the narrative in the data package, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 5/7/03 on an instrument identified as "P4." Mercury analyses were performed in a single CVAA series run on 5/8/03 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). In the CRDL standards bracketing the site sample analyses, recoveries were acceptable (80-120%) except for thallium (46.7% and 75.0%), zinc (79.9% and 79.6%), and selenium (133.5% in the ending CRDL standard).

Results for thallium in all site samples were qualified as estimated (UJ) based on the unacceptably low CRDL standard recoveries. The result for selenium in SW01PB was qualified as estimated (J) based on the unacceptably high CRDL standard recovery. No other positive results were reported for selenium, and the high recovery suggests the potential for reporting false positives or

positive results that are biased high; therefore, no further action was taken with regard to this analyte. Both CRDL standard recoveries for zinc round to 80%; based on professional judgment, no action was taken based on the slightly low CRDL standard recoveries for this analyte.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard was acceptable.

III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of 10 different elements (aluminum, barium, beryllium, cobalt, iron, magnesium, nickel, potassium, sodium, and silver) in each of the initial and continuing calibration blanks (ICB/CCBs). In addition, results for one or more of three elements (arsenic, chromium, and thallium) that were below the negative IDLs were also reported in one or more of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank response.

Results for thallium in all samples and for chromium in SW02PB, SW03PB, and PW01PB were qualified as estimated (UJ) based on negative responses in the associated calibration blanks.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for arsenic (-4.66 µg/L), barium (0.32 µg/L), cadmium (-0.43 µg/L), cobalt (0.93 µg/L), magnesium (62.80 µg/L), nickel (1.94 µg/L), and potassium (209.72 µg/L) were reported in the preparation blank. All sample results for barium, magnesium, and potassium were greater than the applicable action limit for qualification based on the blank responses for these analytes; therefore no sample results for these three analytes were qualified on this basis. Results for cobalt in PW01PB and SW03PB and for nickel in all samples were qualified as less than the reported values (U) due to the associated PBW contamination. Results for arsenic in all samples and for cadmium in SW01PB, SW01DPPB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the PBW.

Some of the actions warranted based on PBW responses are redundant with actions taken based on CCB results; no additional action was taken in these cases.

No field-submitted blanks were associated with these samples.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery) with the exception of lead (79.6%) in the series-ending check sample. Since this value rounds to 80% and since none of the interfering elements (aluminum, calcium, iron, and magnesium) was present at a high concentration in the site samples, no action was taken by the validator on this basis.

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample SW01PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in SW01PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in both of the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

Positive results below the CRDL for cadmium (0.52 µg/L) and selenium (4.24 µg/L) were reported in the original analysis of SW01PB but were not confirmed in the duplicate analysis (0.40 U and 2.6 U), respectively). Cadmium and selenium were also not detected in the field duplicate of SW01PB (SW01DPPB; see Section IX). Based on professional judgment, results for cadmium and selenium in SW01PB were qualified as less than the CRDLs (5.0 U in both cases) due to lack of confirmation in the laboratory duplicate analyses.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample SW01PB with acceptable recoveries (75-125%) for all target elements.

VIII. ICP Serial Dilution

Serial dilution analysis was performed on samples SW01PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference).

IX. Field Duplicates

Sample SW01DPPB was identified as a field duplicate of SW01PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for barium (0.3 RPD), calcium (0.3 RPD), magnesium (0.6 RPD), manganese (1.5 RPD), potassium (0.8 RPD), and sodium (0.5 RPD).

Positive results below the CRDLs for cadmium (0.52 µg/L) and selenium (4.2 µg/L) were reported in SW01PB but were not confirmed in SW01DPPB (0.40 U and 2.6 U, respectively). Similarly, results below the CRDL for copper (2.6 µg/L) and vanadium (1.3 µg/L) were reported in SW01DPPB but was not confirmed in SW01PB (2.3 U and 1.0 U, respectively). Based on professional judgment, results for cadmium and selenium in SW01PB and for copper and vanadium in SW01DPPB were qualified as less than the CRDLs (5.0 U, 5.0 U, 25.0 U, and 50.0 U, respectively) due to lack of field duplicate confirmation at low concentrations.

Lead was reported above the CRDL in SW01DPPB (3.7 µg/L) but was not detected above the IDL in SW01PB (2.7 U). Results for lead in SW01PB and SW01DPPB were rejected (R) as unreliable based on this lack of confirmation at a significant concentration.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 4/15/03 for all ICP elements on P4 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations below the applicable CRDLs. Most of these results were subsequently qualified for reasons previously discussed; no additional action was necessary in these cases. Those sample results that were not so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The result for copper in PW01PB was so qualified on this basis.

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate.

Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). No sample results warranted qualification on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The applicable chain of custody (COC) record was present in the data package. The following issues were noted:

- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on the COC record.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

These COC documentation issues do not affect the technical validity of the data generated for these samples, however they could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RX1067 were qualified as follows:

- Results for thallium in all site samples were qualified as estimated (UJ) based on unacceptably low recoveries in the associated CRDL standards and negative responses in the associated calibration blanks.

- Results for chromium in SW02PB, SW03PB, and PW01PB were qualified as estimated (UJ) based on a negative response in the associated calibration blank.

- Results for cobalt in PW01PB and SW03PB were qualified as less than the reported values (U) due to contamination in the associated preparation blank.

- Results for nickel in all samples were qualified as less than the reported values (U) due to contamination in the associated preparation blank.

- Results for arsenic in all samples were qualified as estimated (UJ) based on a negative response in the associated preparation blank.

- Results for cadmium in SW01DPPB, SW02PB, and SW03PB were qualified as estimated (UJ) based on a negative response in the associated preparation blank.

- Results for cadmium and selenium in SW01PB were qualified as less than the CRDLs (5.0 U) due to lack of confirmation in the laboratory and field duplicate analyses. The reported value for selenium in this sample warranted qualification as estimated based on an unacceptably high recovery in an associated CRDL standard and the reported value for cadmium warranted qualification as estimated based on a negative response in the associated preparation blank; these qualifiers were superseded by elevation of the reporting limit to the CRDL.

- Based on professional judgment, results for copper and vanadium in SW01DPPB were qualified as less than the CRDLs (25.0 U, and 50.0 U, respectively) due to lack of confirmation at low concentrations in the field duplicate analyses.

- Results for lead in SW01PB and SW01DPPB were rejected (R) as unreliable based on lack of confirmation at a significant concentration in the field duplicate analyses.

- The result for copper in PW01PB was qualified as estimated (J) based on an elevated %RSD among the triplicate measurements of this analyte in this sample.

All "B" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLE
SDG No. RX1067
Dissolved Metals in Water

Marion Bragg Landfill - April 2003 - Dissolved Metals in Surface Water Samples

All Results are in ug/L

Collection Point ===>		PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID ========>		PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No. ===>		RX1067-5	RX1067-1	RX1067-2	RX1067-3	RX1067-4
Collection Date. ===>		4/29/03	4/29/03	4/29/03	4/29/03	4/29/03
	CRDL					
Aluminum	200	21.0 U	21.0 U	21.0 U	21.0 U	21.0 U
Antimony	60	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Arsenic	10	4.4 UJ	4.4 UJ	4.4 UJ	4.4 UJ	4.4 UJ
Barium	200	146	73.3	73.1	73.4	61.5
Beryllium	5	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Cadmium	5	1.2	5.0 U	0.40 UJ	0.40 UJ	0.40 UJ
Calcium	5000	45200	74200	74400	75100	90100
Chromium	10	0.70 UJ	0.70 U	0.70 U	0.70 UJ	0.70 UJ
Cobalt	50	1.4 U	0.90 U	0.90 U	0.90 U	1.1 U
Copper	25	9.8 J	2.3 U	25.0 U	2.3 U	2.3 U
Iron	100	19.2 U	19.2 U	19.2 U	19.2 U	19.2 U
Lead	3	2.7 U	R	R	2.7 U	2.7 U
Magnesium	5000	26800	31500	31700	32100	33500
Manganese	15	7.6	20.2	19.9	18.2	39.3
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	40	5.5 U	3.9 U	1.9 U	2.9 U	2.4 U
Potassium	5000	6960	2470	2450	2350	2910
Selenium	5	2.6 U	5.0 U	2.6 U	2.6 U	2.6 U
Silver	10	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Sodium	5000	16200	20100	20000	19700	28200
Thallium	10	7.0 UJ	7.0 UJ	7.0 UJ	7.0 UJ	7.0 UJ
Vanadium	50	1.0 U	1.0 U	50.0 U	1.0 U	1.0 U
Zinc	20	38.1	8.5 U	8.5 U	8.5 U	8.5 U

TRILLIUM INC.

ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RX1067
Dissolved Metals in Water

U. S. EPA-CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PW01PB

PW-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-5

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21.0	U		P
7440-36-0	Antimony	4.5	U		P
7440-38-2	Arsenic	4.4	U	UJ	P
7440-39-3	Barium	146	B		P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	1.2	B		P
7440-70-2	Calcium	45200			P
7440-47-3	Chromium	0.70	U	UJ	P
7440-48-4	Cobalt	1.4	B	U	P
7440-50-8	Copper	9.8	B	J	P
7439-89-6	Iron	19.2	U		P
7439-92-1	Lead	2.7	U		P
7439-95-4	Magnesium	26800			P
7439-96-5	Manganese	7.6	B		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	5.5	B	U	P
7440-09-7	Potassium	6960			P
7782-49-2	Selenium	2.6	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	16200			P
7440-28-0	Thallium	7.0	U	UJ	P
7440-62-2	Vanadium	1.0	U		P
7440-66-6	Zinc	38.1			P

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Comments: DISSOLVED

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-1 SW01PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-1

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21.0	U		P
7440-36-0	Antimony	4.5	U		P
7440-38-2	Arsenic	4.4	~~B~~	UJ	P
7440-39-3	Barium	73.3	~~B~~		P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	5.0 ~~0.52~~	~~B~~	U	P
7440-70-2	Calcium	74200			P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	0.90	U		P
7440-50-8	Copper	2.3	U		P
7439-89-6	Iron	19.2	U		P
7439-92-1	Lead	R ~~2.7~~	~~U~~		P
7439-95-4	Magnesium	31500			P
7439-96-5	Manganese	20.2			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	3.9	~~B~~	U	P
7440-09-7	Potassium	2470	~~B~~		P
7782-49-2	Selenium	5.0 ~~4.2~~	~~B~~	U	P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	20100			P
7440-28-0	Thallium	7.0	~~B~~	UJ	P
7440-62-2	Vanadium	1.0	U		P
7440-66-6	Zinc	8.5	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-1D SW01DPPB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-2

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21.0	U		P
7440-36-0	Antimony	4.5	U		P
7440-38-2	Arsenic	4.4	U	UJ	P
7440-39-3	Barium	73.1	B		P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	0.40	U	UJ	P
7440-70-2	Calcium	74400			P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	0.90	U		P
7440-50-8	Copper	25.0 ~~2.6~~	B	U	P
7439-89-6	Iron	19.2	U		P
7439-92-1	Lead	R ~~3.7~~			P
7439-95-4	Magnesium	31700			P
7439-96-5	Manganese	19.9			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.9	B	U	P
7440-09-7	Potassium	2450	B		P
7782-49-2	Selenium	2.6	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	20000			P
7440-28-0	Thallium	7.0	U	UJ	P
7440-62-2	Vanadium	50.0 ~~1.3~~	B	U	P
7440-66-6	Zinc	8.5	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-5 SW02PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-3

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21.0	U		P
7440-36-0	Antimony	4.5	U		P
7440-38-2	Arsenic	4.4	U	UJ	P
7440-39-3	Barium	73.4	B		P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	0.40	U	UJ	P
7440-70-2	Calcium	75100			P
7440-47-3	Chromium	0.70	U	UJ	P
7440-48-4	Cobalt	0.90	U		P
7440-50-8	Copper	2.3	U		P
7439-89-6	Iron	19.2	U		P
7439-92-1	Lead	2.7	U		P
7439-95-4	Magnesium	32100			P
7439-96-5	Manganese	18.2			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.9	B	U	P
7440-09-7	Potassium	2350	B		P
7782-49-2	Selenium	2.6	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	19700			P
7440-28-0	Thallium	7.0	U	UJ	P
7440-62-2	Vanadium	1.0	U		P
7440-66-6	Zinc	8.5	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-6 SW03PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RX1067

Matrix (soil/water): WATER Lab Sample ID: RX1067-4

Level (low/med): LOW Date Received: 5/1/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21.0	U		P
7440-36-0	Antimony	4.5	U		P
7440-38-2	Arsenic	4.4	U	UJ	P
7440-39-3	Barium	61.5	B		P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	0.40	U	UJ	P
7440-70-2	Calcium	90100			P
7440-47-3	Chromium	0.70	U	UJ	P
7440-48-4	Cobalt	1.1	B	U	P
7440-50-8	Copper	2.3	U		P
7439-89-6	Iron	19.2	U		P
7439-92-1	Lead	2.7	U		P
7439-95-4	Magnesium	33500			P
7439-96-5	Manganese	39.3			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.4	B	U	P
7440-09-7	Potassium	2910	B		P
7782-49-2	Selenium	2.6	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	28200			P
7440-28-0	Thallium	7.0	U	UJ	P
7440-62-2	Vanadium	1.0	U		P
7440-66-6	Zinc	8.5	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA
Chemical Oxygen Demand (COD) in Water

CET Report Dated May 13, 2003
April 2003 Sample Collections

Chemical Analyses Performed by:

Chemical & Environmental Technology, Inc.
Research Triangle Park, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

July 2, 2003

92241/CAE/DAS
\MARION\Aprt03\cod

EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (chemical oxygen demand [COD]) prepared by Chemical & Environmental Technology, Inc. (CET), under subcontract to CompuChem Environmental, for 14 water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package that had no identification number but was dated May 13, 2003. This data package was received for review on May 16, 2003, with additional documentation provided on July 1, 2003. The following field samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)	PW01PB (PW-1)	SW01PB (SW-1)
SW01DPPB (SW-1D)	SW02PB (SW-5)	SW03PB (SW-6)

Based on the validation effort, reported sample results were qualified or corrected as follows:

- Results for COD in GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB were qualified as less than the reported values (U).
- All sample results for COD (including reporting limits) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory).

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section IX). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section VIII.

This validation report should be considered part of the data package for all future distributions of the COD data.

INTRODUCTION

Analyses were performed according to EPA's "Chemical Analysis of Water and Wastes" (EPA-600/4-79-020), March 1983, Method 410.4. Since no guidelines specific to the analytical method used are available, the validation was based on the requirements of the referenced procedure, the specifications of the project-specific Quality Assurance Project Plan (QAPP), and best professional judgment. The validation approach was similar to that described in EPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994). Results of sample analyses were reported by the laboratory without qualifications.

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that the data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's National Functional Guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: The analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the client-customized data tables (Attachment A) and the laboratory's Analytical Reports (Attachment B) to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last

resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The water samples were collected on 4/29-30/03. All COD analyses were conducted well within the 28-day holding time specified by both the referenced method and the QAPP.

An acceptable (4°C ±2°C) cooler temperature on receipt of the samples at CET (3°C) was recorded on the chain of custody (COC) records documenting the shipment of samples from CompuChem to CET. Preservation with sulfuric acid and ice was also recorded on the two applicable COCs by CompuChem, but no documentation of sample pH on receipt at CET was found in the data package. However, the use of sulfuric acid and ice was documented on the field COCs (documenting shipment of the samples from the site to CompuChem) and verification of successful acidification of the COD sample containers was documented on CompuChem's receiving logs, all of which were provided in CompuChem's data packages for the other analysis parameters requested on these samples. Therefore, no action was taken on this basis.

II. Calibrations

The reported COD analyses were performed on 5/6/03 and 5/7/03. Raw data documentation of an initial calibration (IC) performed on 6/3/02 was provided on 7/1/03 at the validator's request. This date was recorded on the bench sheets in a field labeled "Curve Date," but the supporting data for the IC were not provided in the data package as initially received for review.

The 6/3/02 IC was established using five standard concentrations ranging from 10 mg/L to 150 mg/L. The best-fit linear regression describing the calibration curve gave an acceptable correlation coefficient (>0.995) and was verified by the validator.

Although the referenced method does not specify a maximum period of time that an IC may be used, good laboratory practice would suggest that 11 months is excessive. Ideally, the instrument should be calibrated prior to each use. Realistically, a minimum of once every month or two is strongly recommended.

A check standard at 75 mg/L was run at the start of each COD analysis series. Acceptable recoveries (QC 85-115%) were reported (98% and 98%) and verified by the validator.

III. Blanks

A blank was run at the start of each COD analysis series. No absorbance response was documented for either of these blanks.

The laboratory-specified RL of 10 mg/L is equivalent to the low concentration standard used to establish the initial calibration, and is therefore supported by the data as presented.

All sample results were greater than or equal to 10 mg/L and were reported to two significant figures by the laboratory; this is consistent with the results as found on the bench sheets. However, the historical data generated in support of this project reflect three significant figures for results that are greater than or equal to 10.0 mg/L. Since raw data for the relevant IC were provided by the laboratory, the sample results could be calculated by the validator and reported to three significant figures, where appropriate, for consistency with the historical project data. Positive results reported for COD in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, GW09FBPB, PW01PB, and SW03PB and the RLs for all remaining samples in this data set were so corrected by the validator. In several cases, it was noted that the validator-calculated result did not round to the laboratory-reported value. This was assumed to be due to rounding error, and no action was taken on this basis.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was affected by the findings of the validation effort.

VIII. Documentation

Field-initiated COC records were not included in the COD data package, but were available in the CompuChem data packages for the other analysis parameters run on these samples. Two COC records documenting transfer of the samples from CompuChem to CET were present. All samples reported in this data set were listed on these forms, which were accurately completed except that sample pHs were not recorded by CET on sample receipt.

At the validator's request for missing IC raw data, CET provided (through CompuChem) the appropriate raw data for the relevant IC. The IC raw data page was inserted into the original data package by the validator.

These documentation issues do not directly affect the technical validity of the analytical data generated, but they could be problematic if the data were used in litigation.

IX. Overall Assessment

Based on the validation effort, reported sample results were qualified or corrected as follows:

- Results for COD in all ground water samples where it was detected (GW07PB, GW03PB, GW04PB, GW05PB, and GW06PB) were qualified as less than the reported values (U) due to contamination in the associated field blank.

- All sample results for COD (including RLs) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory) for consistency with the historical data generated for this project.

Documentation issues are discussed in Section VIII.

This validation report should be considered part of the data package for all future distributions of the COD data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
COD in Water
April 2003 Sample Collections - Marion Bragg Landfill
CET Report dated May 13, 2003

Marion Bragg Landfill - April 2003 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Point ===>		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID ========>		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ===>		206942	206943	206941	206937	206938	206939	206940	206944
Collection Date. ===>		4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03	4/30/03
	RL								
COD	10.0	10.0 U	10.0 U	26.4 U	15.6 U	17.7 U	15.6 U	63.0 U	10.0 U

Marion Bragg Landfill - April 2003 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Point ===>		MB-10	Field Blank	PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID =========>		GW01PB	GW09FBPB	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No. ===>		206936	206935	206934	206930	206931	206932	206933
Collection Date. ===>		4/30/03	4/30/03	4/29/03	4/29/03	4/29/03	4/29/03	4/29/03
	RL							
COD	10.0	10.0 U	15.6	17.7	10.0 U	10.0 U	10.0 U	19.9

TRILLIUM INC.

ATTACHMENT B

ANALYTICAL REPORTS
COD in Water
April 2003 Sample Collections - Marion Bragg Landfill
CET Report dated May 13, 2003

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206942 SAMPLE ID- GW08PB MB-1 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1400
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~<10~~ 10.0 U	~~mg/L~~ mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.K

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206943 SAMPLE ID- GW08DPPB MB-1D SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1400
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~<10~~ 10.0 U	~~mg/L~~ mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.H

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206941 SAMPLE ID- GW07PB MB-2 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1320
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~26~~ 20.4 U	mg/L	10

CAE 7/2/03

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

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FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206937 SAMPLE ID- GW03PB MB-5 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 0945
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~15~~ 15.6 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206938 SAMPLE ID- GW04PB MB-6 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1015
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~17~~ 17.7 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.M

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206939 SAMPLE ID- GW05PB MB-7 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1100
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~15~~ 15.6 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. M

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206940 SAMPLE ID- GW06PB MB-8 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1145
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~63~~ 63.0 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/8/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206944 SAMPLE ID- GW02PB MB-9 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 0900
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/07/03	JMB	~~<10~~ 10.0 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 5/21/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206936 SAMPLE ID- GW01PB MB-10 SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 0820
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~<10~~ 10.0 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206935 SAMPLE ID- GW09FBPB Field Blank SAMPLE MATRIX- GW
DATE SAMPLED- 04/30/03 TIME SAMPLED- 1130
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~15~~ 15.6	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR R.L.M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206934 SAMPLE ID- PW01PB PW-1 SAMPLE MATRIX- GW
DATE SAMPLED- 04/29/03 TIME SAMPLED- 1620
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~17~~ 17.7	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

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CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206930 SAMPLE ID- SW01PB SW-1 SAMPLE MATRIX- GW
DATE SAMPLED- 04/29/03 TIME SAMPLED- 1510
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~<10~~ 10.0 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206931 SAMPLE ID- SW01DPPB SW-1D SAMPLE MATRIX- GW
DATE SAMPLED- 04/29/03 TIME SAMPLED- 1510
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~<10~~ 10.0 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

AE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. K

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206932 SAMPLE ID- SW02PB SW-5 SAMPLE MATRIX- GW
DATE SAMPLED- 04/29/03 TIME SAMPLED- 1645
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~<10~~ 10.0 U	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/2/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.K

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 05/08/03

SAMPLE NUMBER- 206933 SAMPLE ID- SW03PB SW-6 SAMPLE MATRIX- GW
DATE SAMPLED- 04/29/03 TIME SAMPLED- 1700
DATE RECEIVED- 05/02/03 SAMPLER- CLIENT RECEIVED BY- MNH
TIME RECEIVED- 1150 DELIVERED BY- C BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	05/06/03	JMB	~~19~~ 19.9	mg/L	10

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

CAE 7/8/03

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

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